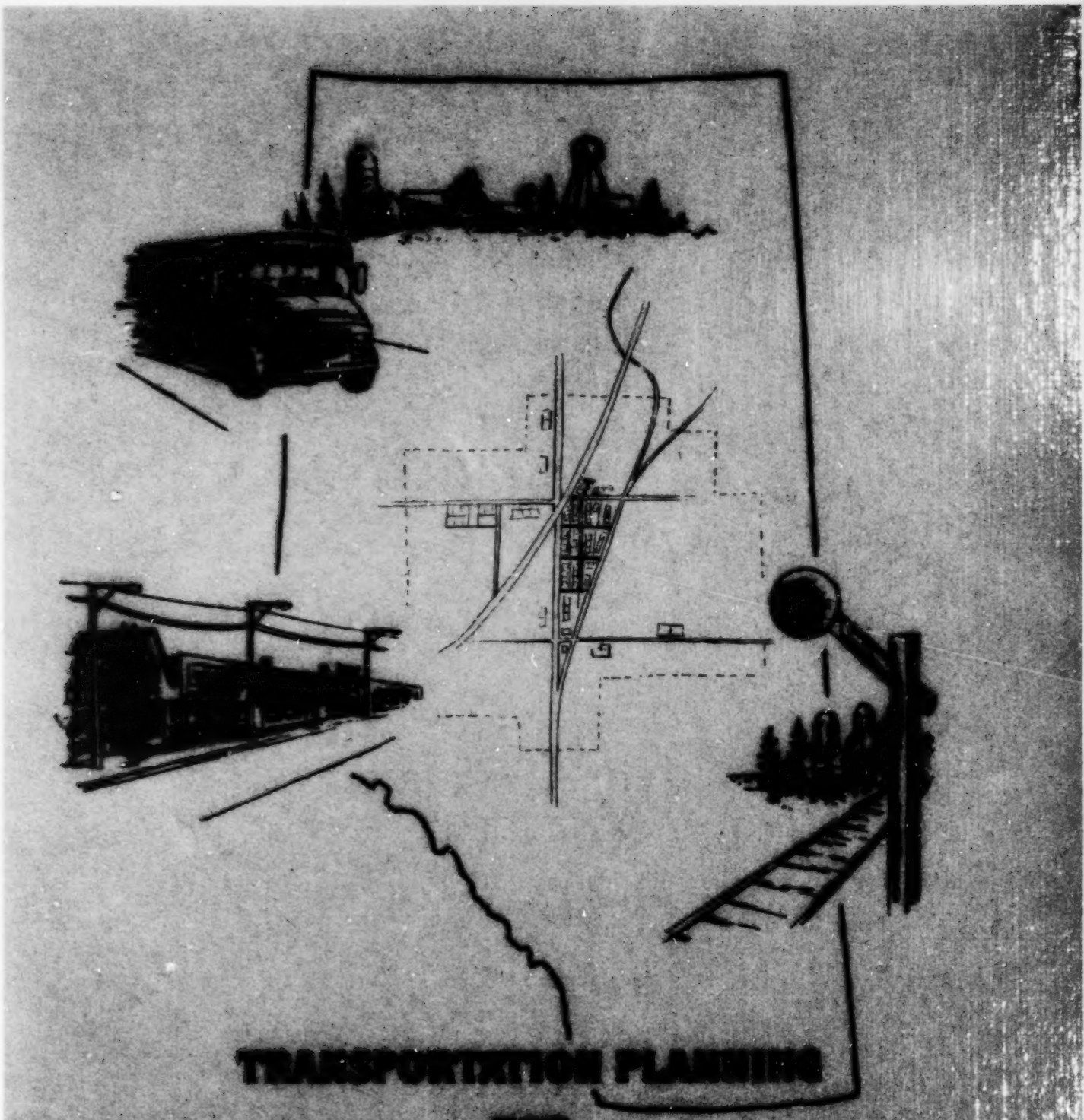
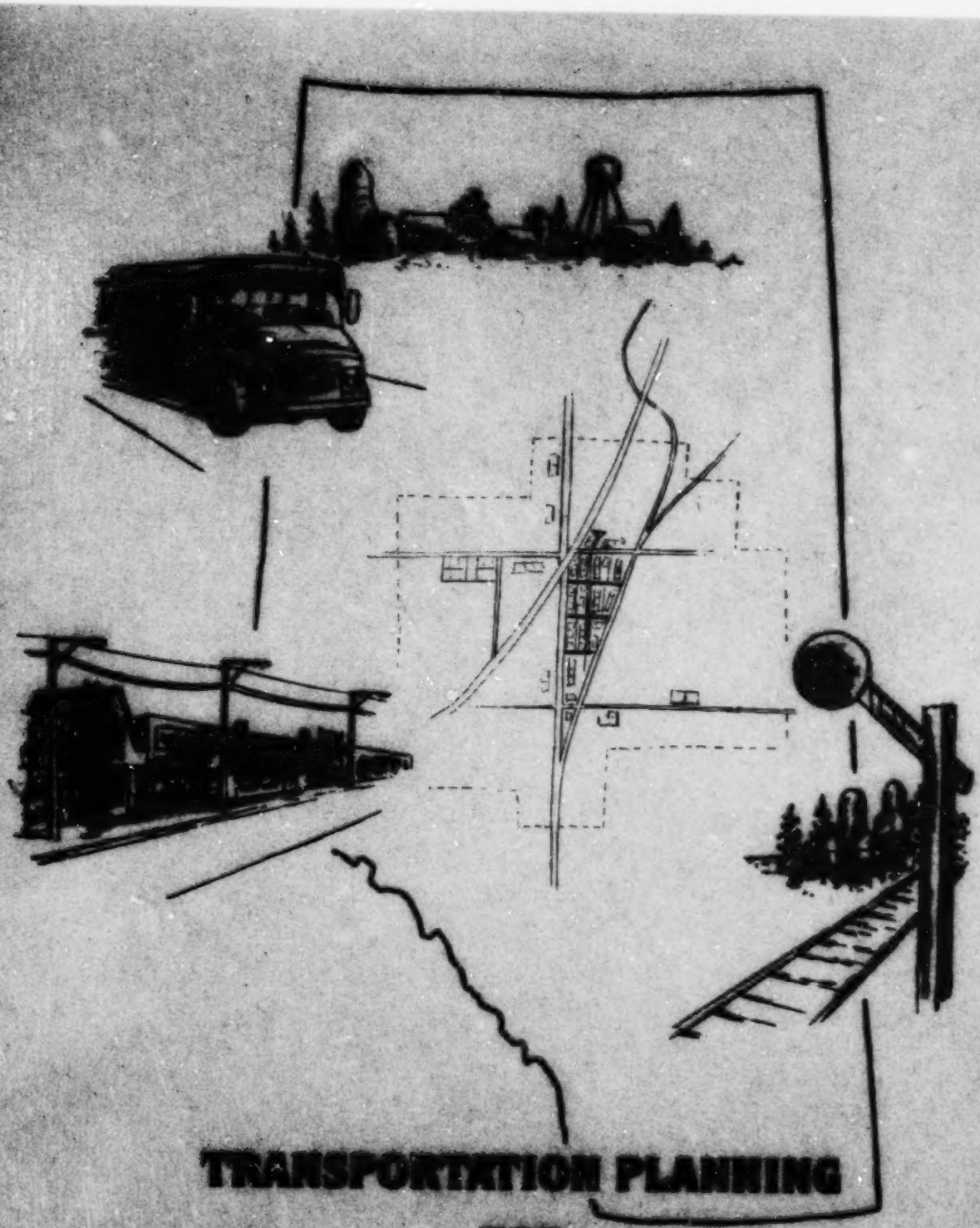


TRANSPORTATION PLANNING FOR SMALLER URBAN COMMUNITIES



TRANSPORTATION PLANNING FOR SMALLER URBAN COMMUNITIES

Alberta
TRANSPORTATION

TRANSPORTATION PLANNING FOR SMALLER URBAN COMMUNITIES

Prepared for
ALBERTA TRANSPORTATION

by
STANLEY ASSOCIATES ENGINEERING LTD.

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SUBJECT INDEX

A subject index is provided in Appendix A. It identifies the sections of this document where detailed information on the identified subject can be found. The index can be used to identify specific items of interest or to locate definitions for technical terms which are not familiar to the reader.

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INTRODUCTION

Managing growth in a community is a challenging and continuing process. In accommodating growth, the provision of an adequate transportation infrastructure is often one of the most critical servicing considerations. It represents the single most expensive utility that is provided in a community, and transportation facilities are highly visible to the public. For these reasons it is important that both existing and future transportation systems in a community be properly planned, designed and constructed.

Most communities are concerned with identifying future directions and magnitude for growth and the associated transportation infrastructure, but are not always sure of how these future plans are prepared and the process which is usually followed. This document has been prepared to provide communities with information on, and an appreciation for, the issues and concerns relating to transportation planning. The principal objectives are:

- To provide an appreciation for the complexities of transportation planning and the inter-relationships with land use plans.
- To identify the major factors that have the greatest impact on the preparation of a transportation plan and which must be addressed during the preparation of the plan.

It is hoped that the document will serve as an information guide which can be used by municipalities as a basis for understanding their transportation requirements and/or developing a transportation component of the **General Municipal Plan and also to alert them to situations when they should seek assistance from senior levels of government or qualified consultants to help them complete their plans.**

The document is divided into five sections. Section 1 provides an overview of the general planning process and outlines the reasons why a transportation plan should be prepared. In Section 2 the basic process in developing a transportation plan, from the establishment of a steering committee to the actual preparation of the plan, is described. The major factors to consider in preparing a transportation plan are outlined in Section 3 and the alternative roadway standards are discussed in Section 4. Finally, Section 5 presents a strategy for implementing and monitoring the transportation plan.

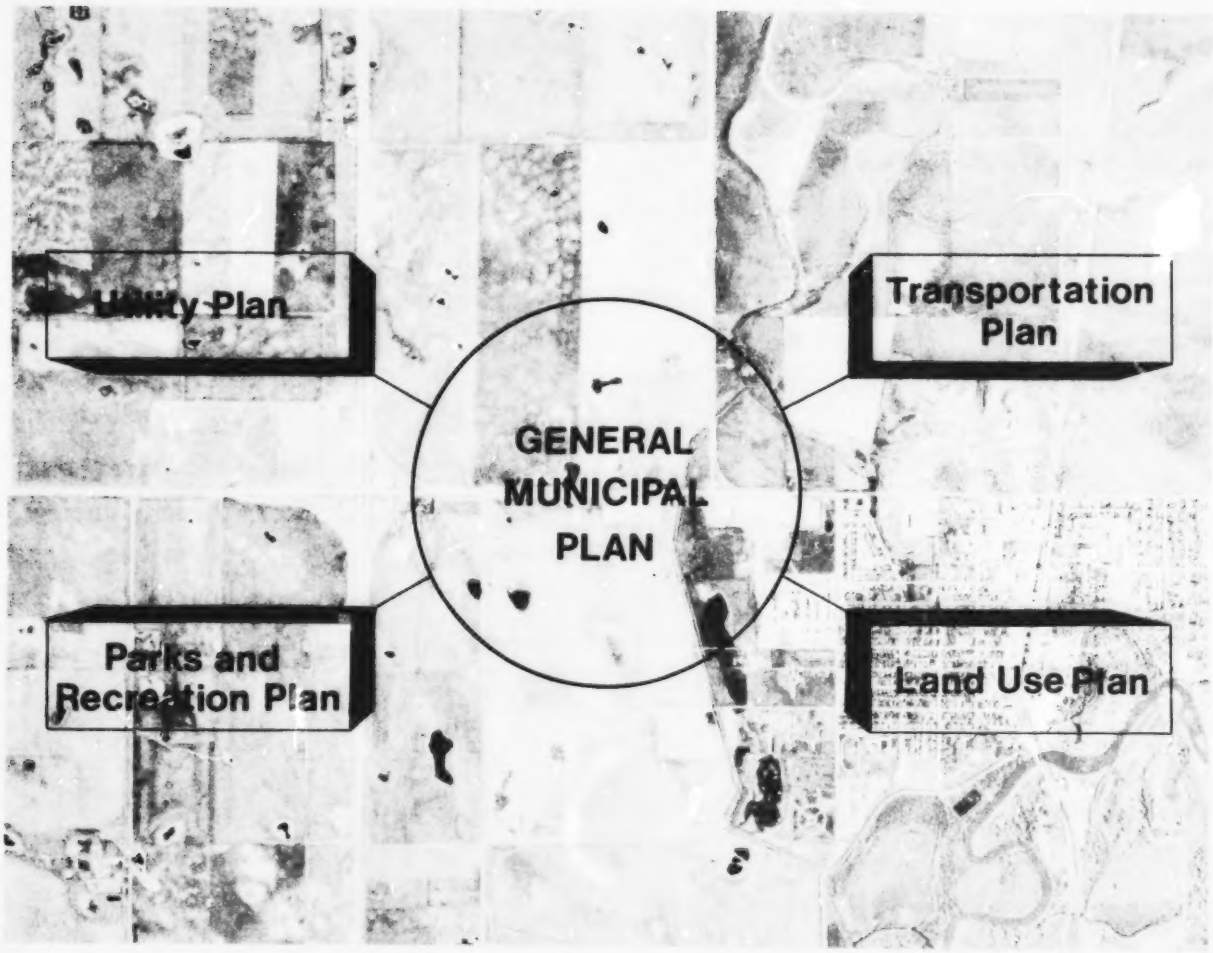


FIG. 1

THE PLANNING PROCESS

1. THE NEED FOR A TRANSPORTATION PLAN

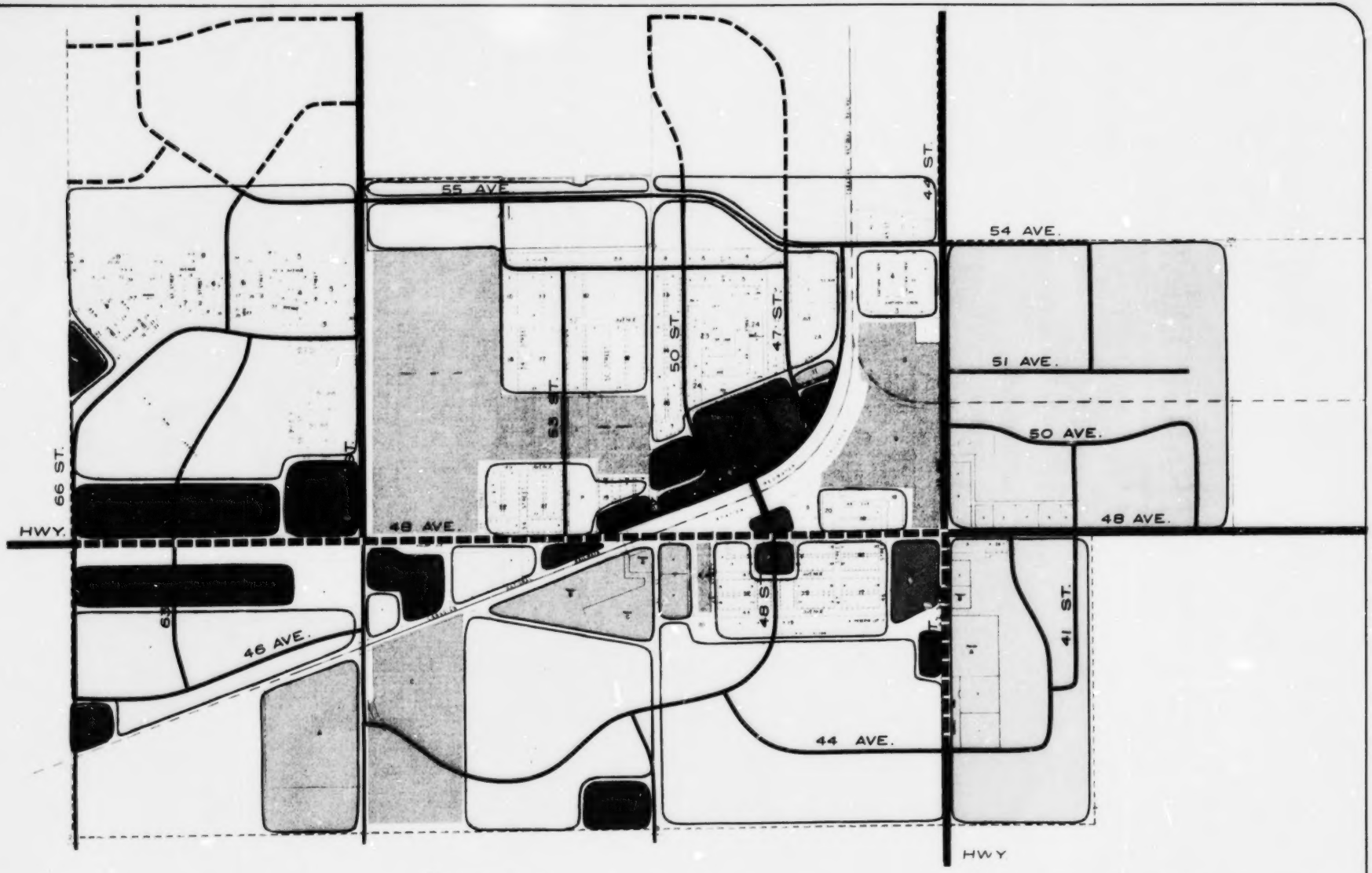
1.1 OVERVIEW OF PLANNING IN GENERAL

Transportation represents only one of the components included in the overall planning which should be undertaken in a community. Accordingly, it is appropriate to review the planning process and how land use planning and transportation planning are interrelated.

The principal planning document prepared in Alberta communities is the General Municipal Plan (G.M.P.), a document which outlines the overall growth objectives of the community. In preparing this plan, several components are required including a transportation plan, a utility plan and a parks and recreation plan, as illustrated in Figure 1. A transportation plan should always be prepared as part of a General Municipal Plan.

A transportation plan is a guide which outlines the requirements and the implementation strategy for future transportation facilities in a community. In smaller urban communities it usually consists of a map of the community where existing and proposed roadway facilities are indicated, by category. The map is also usually accompanied by a written report which outlines the basic goals and objectives of the plan which lists relevant assumptions (land use, population and employment growth, etc.) used to develop the plan.

It should be noted that the level of detail



Legend

- ARTERIAL - 4 LANE UNDIVIDED
- ARTERIAL - 2 LANE UNDIVIDED
- COLLECTOR - 2 LANE UNDIVIDED
- COLLECTOR ROADWAYS REQUIRED BEYOND THE 6,100 POPULATION LEVEL.

- RESIDENTIAL
- COMMERCIAL
- INDUSTRIAL
- PUBLIC / OPEN SPACE / PARKS
- INSTITUTIONAL / GOVERNMENT

A TYPICAL GENERAL MUNICIPAL PLAN FOR A SMALLER URBAN CENTRE (REDWATER) ILLUSTRATING TRANSPORTATION AND LAND USE COMPONENTS AND THEIR INTERFACE.

presented in a transportation plan is conceptual in nature. There are other levels of planning and design which must be undertaken before a transportation facility is actually constructed. The general planning process as it relates to transportation facilities in increasing level of detail can be summarized as follows:

1. **General Municipal Plan** - during the preparation of this plan a **transportation plan** is also prepared. This plan indicates the number of new facilities (principally arterials) required and their approximate alignment (± 200 m).

2. **Area Structure Plan (A.S.P.)** - this plan outlines in more detail the configuration of an area, consisting of several neighbourhoods and the land use allocations for each, including population and employment density. At this time, arterial alignments are further refined (± 50 m) and a collector roadway system is established. **A Functional Plan** is usually prepared after an A.S.P. and it finalizes the location and cross-section of each arterial facility and establishes the right-of-way requirements. Preliminary geotechnical investigations are normally done at this stage.

3. **Neighbourhood Structure Plan** - this plan is prepared, in most instances, and it establishes the final alignments of all arterial, collector and local streets as well as proposed land use zoning designations.

4. **Tentative Plan of Subdivision** - at this stage individual lots are identified along with exact right-of-way requirements for all roadways and lanes. **Detailed Roadway Design** drawings are usually prepared after this plan has been completed.

In this document only the considerations relating to the preparation of the transportation plan are discussed.

1.2 THE NEED TO PREPARE A PLAN

One of the best ways to explain why a community should prepare a transportation plan is to outline how a typical community may evolve "by default" without good planning.

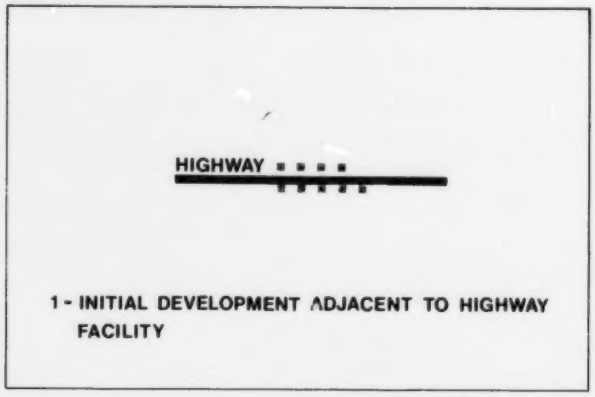
Often a town or a city in Alberta has evolved from a small community in a manner similar to that described below and as depicted in Figure 2.

- Small urban areas consisting of residences and businesses develop adjacent to a highway facility in a linear fashion, to serve the surrounding farming or industrial community and to provide services to the travelling public. Usually, this development is concentrated at the intersection of highest traffic volume in the community so that businesses can take

advantage of the traffic exposure along the main highway facility.

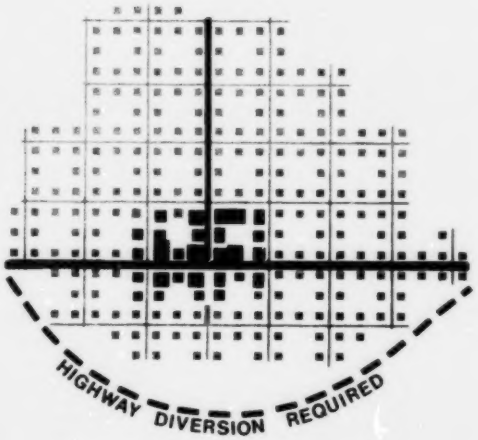
- As the surrounding rural area develops and activity increases, the community and the services it provides grow to meet the needs of not only the rural area but the residents of the town itself. Although the community may be linear in nature, some development may occur perpendicular to the highway serviced by local parallel roadways. At this time a higher intensity use Central Business District (C.B.D.) starts to be established around the initial node of development.

- As employment opportunities in the municipality materialize, there is an accompanying need to provide for more residents and more services. Further growth occurs both parallel and perpendicular to the highway. An internal roadway system for intra-urban traffic begins to develop, usually in a grid pattern with all streets of a similar size and performing similar functions. The community remains dependent on the highway for access, and for local traffic movement. At this time the exposure to highway traffic for most businesses becomes secondary to serving the



1 - INITIAL DEVELOPMENT ADJACENT TO HIGHWAY FACILITY

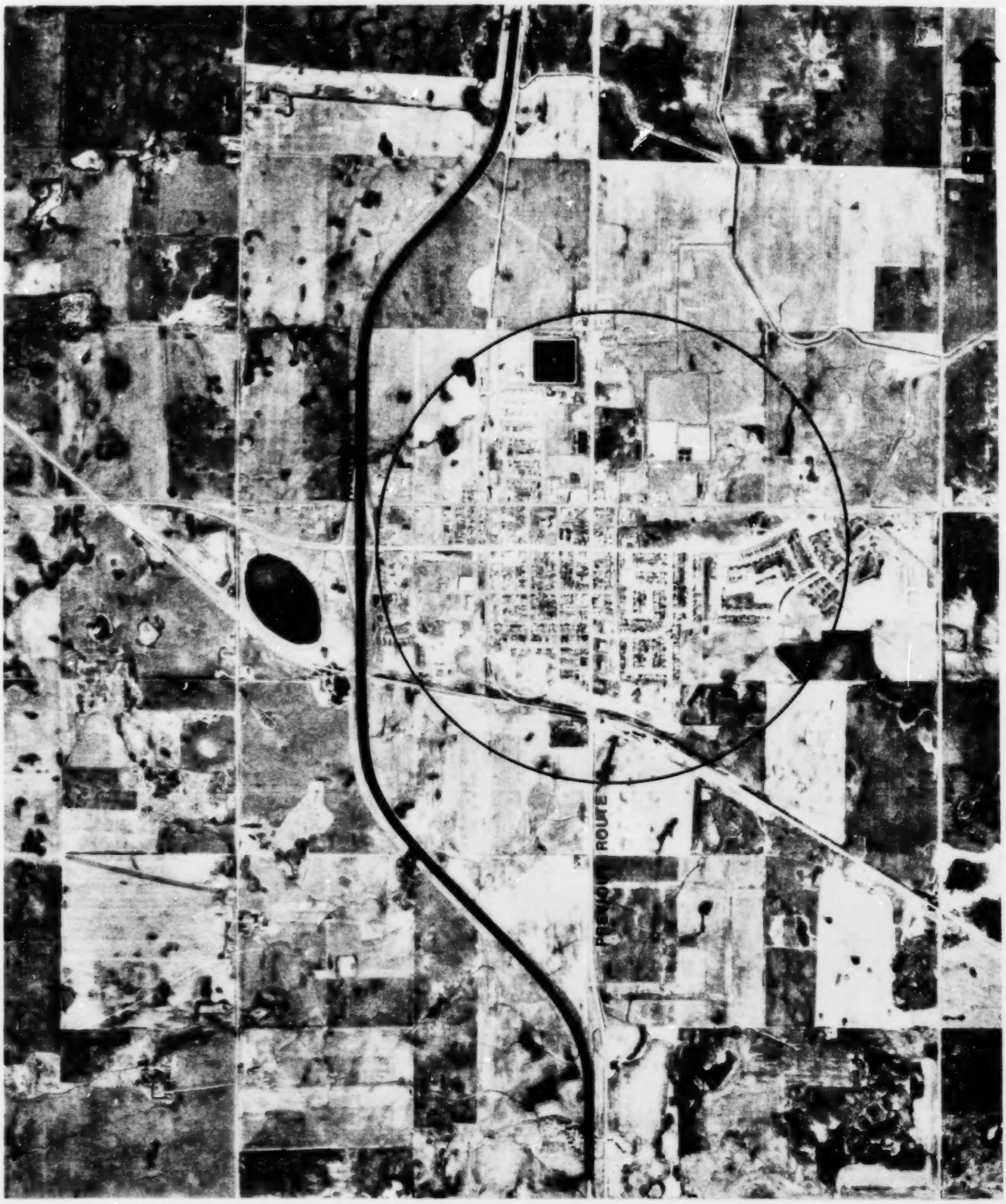
2 - C.B.D. DEVELOPMENT



3 - NEED FOR HIGHWAY DIVERSION

FIG.2

EVOLUTION OF A COMMUNITY



The above photo illustrates how the Town of Morinville developed on both sides of Highway 2 until traffic congestion necessitated the construction of a Highway by-pass to the west.

needs of the community. That is, the larger the community the less dependent it usually becomes on the highway. Accompanying this is increased congestion along the roadway since it must provide for many different types of traffic.

- As growth continues to occur, problems begin to develop both on the highway and on the internal roadway system. Through-traffic on the highway starts to conflict with community traffic and access to adjacent properties is impeded. When the problem becomes severe, pressures mount for the highway to be diverted around the community to accommodate the through traffic. High traffic volumes begin to occur on some local roadways, creating capacity problems and eliciting complaints from adjacent residents, since the roadways were not designed for this purpose. If a by-pass is not provided congestion and a lower level of service will result.

1.3 OBJECTIVES OF A TRANSPORTATION PLAN

The negative impacts of the planning by default scenario can be minimized with the preparation of a transportation plan. The plan will establish a strategy for the development of future transportation facilities to accommodate the expected growth in the community. In general, the transportation plan should:

- Identify a roadway system hierarchy for the existing and proposed transportation network and the Transportation Management System and Strategies required to ensure adherence to it.

- Ensure that sufficient land is reserved to provide for roadway right-of-way to meet the future needs of the community.

- Ensure that the roadway design reflects the type and amount of traffic using it, thereby minimizing future safety, operational and environmental concerns.

- Ensure that the transportation system is efficient and within the financial capability of the community.

- Provide a guide for capital expenditure on roadways.

- Ensure that the transportation system is sufficiently flexible and expandable to accommodate future growth.

- Ensure that the road system is compatible with existing and proposed development plans and that future growth does not aggravate existing problems.

- Identify interface and ensure integration of the community road system with the regional road system.

When a plan containing all of the above components has been prepared, it is usually advisable to segregate the recommended improvements into four categories:

- Immediate
- Short Term
- Medium Term
- Long Term

This will enable the improvements to be identified in manageable components for establishing financing needs and construction timetables. It will also assist in identifying the relative level of detail required for each component of the plan.

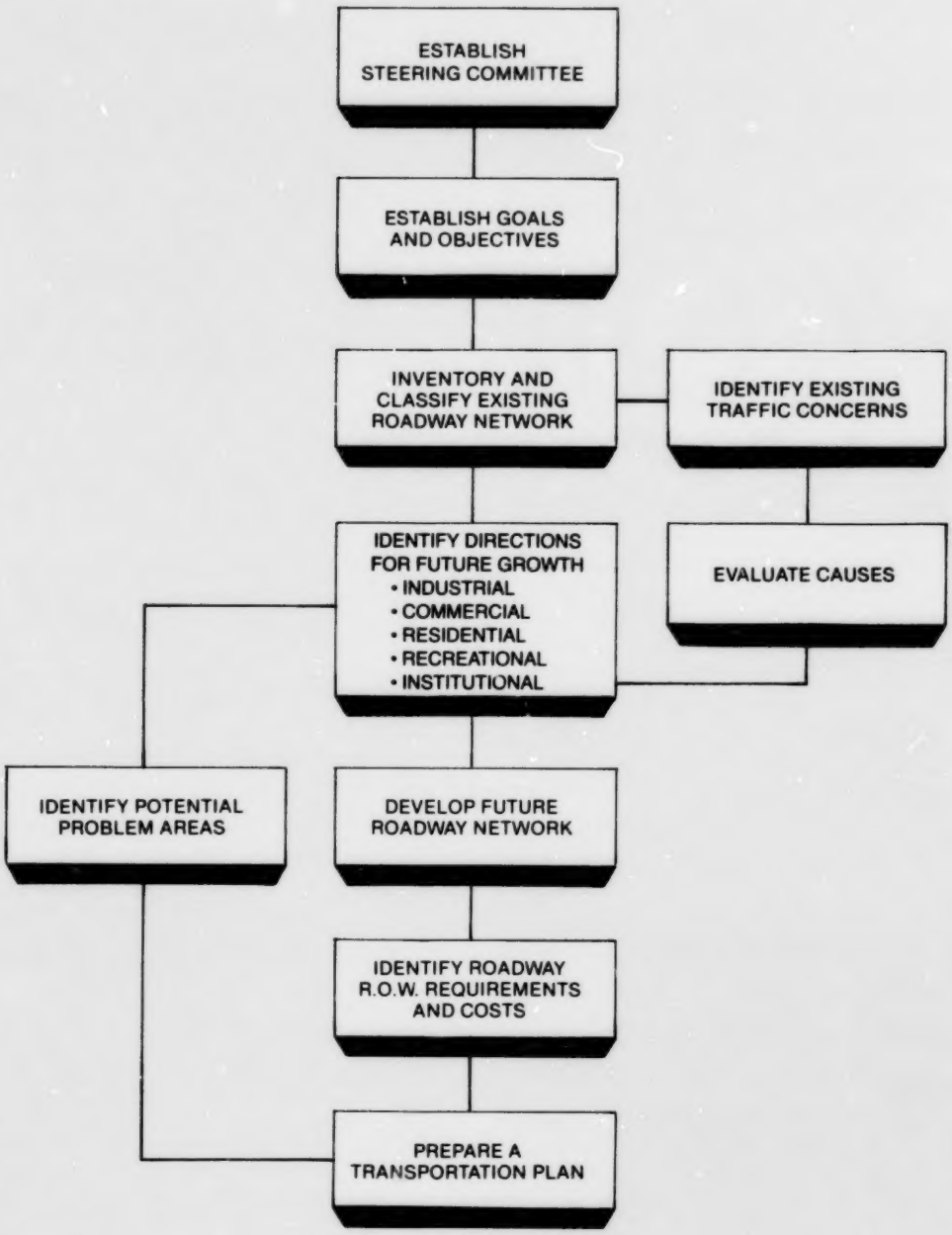


FIG. 3

THE SIMPLIFIED TRANSPORTATION PLANNING PROCESS

2. BASIC PROCESS IN DEVELOPING A TRANSPORTATION PLAN

Transportation planning can be effectively undertaken in many communities by utilizing some basic planning concepts, general guidelines and procedures. Figure 3 shows a brief overview of the general process which should be followed in the preparation of a transportation plan.

2.1 ESTABLISH STEERING COMMITTEE

The first task in undertaking a transportation plan is to establish a Steering Committee and to allocate tasks to each of the members. Desirably, this committee should consist of representation from the municipal administration, elected officials, Alberta Transportation, the Regional Planning Commission, if applicable, and representatives from adjoining municipalities, counties, municipal districts or improvement districts. The roles and duties of the committee will vary with each community; however, in general, they may consist of:

- Providing input on community goals and objectives, and acting as a liaison with the town council.

- Providing input on existing bylaws, assisting with classification of existing roadway systems and identifying existing traffic concerns.

- Identifying directions for future growth.

- Providing assistance in identifying a future roadway network and its interface with the regional transportation system.

Although the Steering Committee assists with the preparation of the transportation plan, the actual work can be undertaken by a transportation planning consultant or by in-house staff, with assistance from Alberta Transportation.

2.2 ESTABLISH GOALS AND OBJECTIVES

Each municipality has unique growth aspirations. Some have natural or man-made advantages which are conducive to rapid growth. Others may prefer little or no growth at all. Therefore, it is important for the community, through its elected representatives or other form of participation, to establish a long-range vision of the type of community which is desired by its residents. This vision can then be translated into specific goals and objectives for the community, which will guide the overall scope and type of growth which occurs in a community.

2.3 INVENTORY AND CLASSIFICATION OF THE EXISTING ROADWAY NETWORK

The first step in preparing a transportation plan is to recognize that individual roadways should be designed to undertake specific roles. Roadways should be classified and designed to suit the individual roles they fulfill in accommodating travel in a community. If this is done, many potential traffic problems can be avoided.

The following general guidelines can be used to establish existing classifications:

- A continuous roadway should be considered for collector or arterial classification.

- Any roadway which forms part of a regional highway linkage providing access to and through a community should be classified as an arterial in recognition of its function to carry through traffic.

- Any roadway which forms an extension of the rural secondary network should be considered for arterial or collector status.

- The main street serving the central business district should be classified as an arterial or, in some instances, a collector.

- Observed traffic volumes, if available, can provide an indication of the function of various roadways in a small community as follows:

    - Arterial Roadways - above 5,000 vpd
    - Collector Roadways - 1,000 to 5,000 vpd
    - Local Roadways - less than 1,000 vpd

If traffic volumes are not available, some consideration should be given to undertaking a counting program as outlined in later sections of this report.

Although the above guidelines can be used, the principal function of the roadway is to be considered the primary criterion in establishing the classification.

2.4 IDENTIFYING EXISTING TRAFFIC CONCERNS AND PROBABLE CAUSES

The classification of the existing roadway network can provide some insights into possible causes of existing traffic conerns. Many concerns can be identified in the community by local residents; however, it is desirable to have an experienced "outsider" identify potential or emerging problems that might be missed by locals. Some typical concerns in small communities include:

- Access control
- Dangerous intersections
- Truck traffic
- Dangerous Goods Routing
- Railway crossing delays
- Bridge crossing delays
- Parking problems
- Congestion
- School and Pedestrian crossings
- Signing
- Noise
- Lighting

By identifying existing problem locations, insights into planning a future roadway network are gained. By identifying the causes of the problems the same conditions are not allowed to materialize in the future.

In a planning study specific solutions to traffic operational problems are not outlined. These should be addressed in a separate analysis.

2.5 IDENTIFY DIRECTIONS FOR FUTURE GROWTH

In most communities, some general planning will have been undertaken to determine the manner in which the growth should take place. However, it is important that land use planning and transportation planning be integrated so

that the two are compatible. Future roadways must be constructed to serve the growth areas; however, growth directions should not always be decided without considering transportation needs or impacts.

In selecting future growth directions an iterative process is used which consists of evaluating alternatives in concert with the required transportation infrastructure. The process can be summarized in four steps:

- Determine the Future Land Requirements
- Determine the Directions for Future Growth
- Evaluate the Alternative Growth Scenarios
- Select the Desirable Growth Direction.

Step 1 - Determine Future Land Requirements

Usually, land requirements are established for a 10- or-20 year period. A reasonable estimate of this demand can be developed using historical trends of land absorption or by forecasting expected economic activity in an area.

Community growth involves the additional consumption of land for different uses:

- industrial
- commercial
- residential
- institutional
- recreational

In conjunction with the use of land for various residential and employment-related activities, land is also required for utility services such as power, telephone, water, sewers and transportation facilities. The provision of an adequate transportation infrastructure is often one of the most critical servicing considerations because:

- Transportation facilities are highly visible to the public and are used daily.
- Improperly planned roadways can have major social, environmental, safety and cost implications.
- Transportation facilities represent the single most permanent and expensive utility that is provided in a community.

Step 2 - Determine the Directions for Future Growth

The various land categories should be situated within the community to achieve an efficient, harmonious environment. In most communities, the directions of growth may appear to be obvious; however, there may be a few alternatives. In developing practical alternatives, the following guidelines are usually considered:

- Land uses should generally be compatible with the available and proposed transportation system. For example, unnecessary crossings of major highways should be avoided. Also, truck routes through residential areas should be minimized.

- It must be feasible and practical to extend services to the new growth areas.

Step 3 - Evaluation of Alternative Growth Scenarios

Alternative growth directions are normally based on the following:

- Flexibility to change.
- Cost to provide services, including transportation.
- Flexibility to expand beyond a 10- or 20-year period.
- Environmental impacts.
- Social impacts.
- Safety impacts.
- Ownership and supply of land for residential, commercial, industrial uses, etc.

Step 4 - Select Desirable Growth Direction

The most desirable alternative growth direction should be selected on the basis of which concept is within the financial capability of the municipality and which minimizes the negative environmental, social, and safety impacts. In particular, a preferred concept which minimizes the transportation/servicing costs and impacts should be selected.

2.6 DEVELOP FUTURE ROADWAY NETWORKS

In Alberta, the two principal forms of intra-urban transportation are by automobile or truck via the roadway network. Walking (and to a lesser extent cycling) are other significant forms of transportation in a community. Public transportation normally is a non-existent or very minimal part of the transportation system in a small urban area.

The regional roadway (highway) network provides for the dominant transportation movement outside the community for both people and goods transportation. For longer distance transportation of commodities the rail system is also a significant mode.

Transportation is required to support the many land use activities in an urban community. On a daily basis people make trips for such purposes as shopping, business, work, recreation, etc. The purpose of a transportation system is to accommodate the needs of the community to make these trips in a safe and efficient manner.

It is important to get an appreciation for the various types of trips which take place in a community, so that the transportation system

in the community can be designed specifically to accommodate these needs. Also, it should be recognized that due to the differing nature of these trips, they require different standards of roadways to accommodate them. These standards are discussed in later sections of this report.

There are three generally accepted categories of trips used in transportation planning:

- Internal Trips
- Internal/External Trips
- External Trips

Internal trips are trips where both the origin and destination of a trip are within the community (Fig. 4).

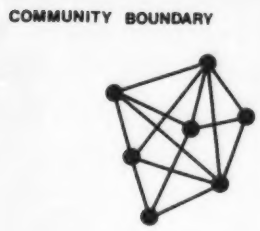


FIG. 4
INTERNAL TRIPS

Internal trips are further subdivided into four classifications (Fig. 5):

- Home-Based Work Trips:
  A work trip where either the origin or destination of the trip is at home. On a daily basis, these usually represent 30 to 40 percent of the trips in a community.

- Home-Based Shopping Trips:
  A shopping trip made principally to the central business district or to a shopping centre from the home. Usually accounts for between 10 and 20 percent of daily trips made.

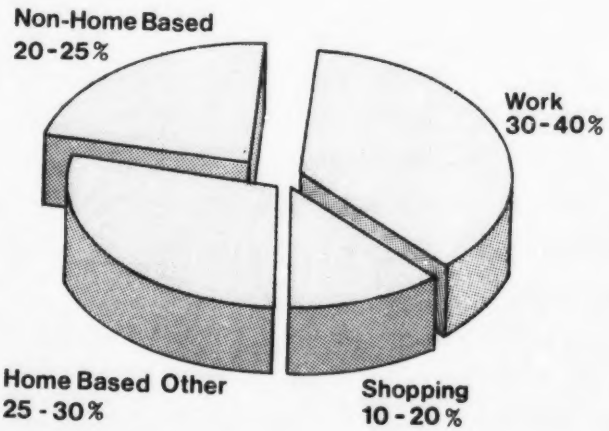


FIG. 5
DAILY INTERNAL TRIP CATEGORIES

- Home-Based Other Trips:
  A trip made between a residence and other areas of the community for recreational, personal service or social purposes. These may represent between 25 and 30 percent of the daily internal travel.

- Non Home-Based Trips:
  These trips have neither an origin nor destination of a trip end at home. Trips are usually made for business purposes and can represent between 20 to 25 percent of the daily internal trips made.

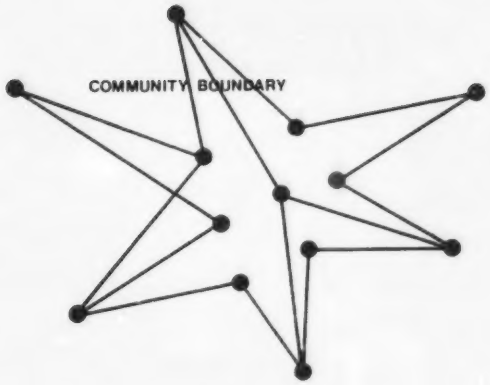


FIG. 6
INTERNAL/EXTERNAL TRIPS

Internal/External trips are trips where either the origin or destination of a trip is within the community (Fig. 6). They represent trips which are made to the community for purposes of travel to work, shopping, recreation, personal service and business.

External trips are trips where neither the origin nor destination of the trip is within the community (Fig. 7). At times these trips can be very substantial, especially when the major primary or secondary highway facility runs through or adjacent to a community. As such, they require special consideration. The two basic categories of external trips are:

- **Through Trips** which are trips which pass through the community without stopping.

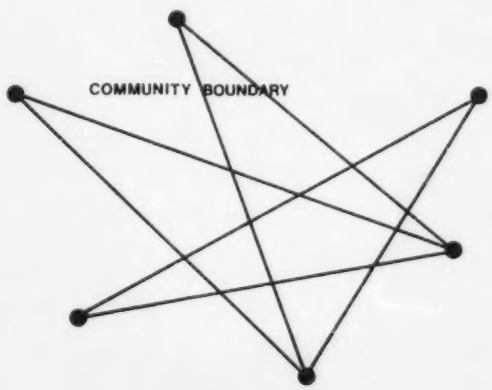


FIG. 7
EXTERNAL TRIPS

- **Through-Stop Trips** which are trips where a stop is made in the community before proceeding through it.

In developing a future roadway network plan the first task is to identify arterial and possible collector facilities. To assist with this task the major desire lines for travel in the community should be established. Desire lines should be established for trips between residential and employment areas to identify the principal home to work desires (Fig. 8) and between employment areas to establish the need for truck routes (Fig. 9). Desire lines simply indicate the need for providing a connection between the designated nodes without regard for roadway alignments.

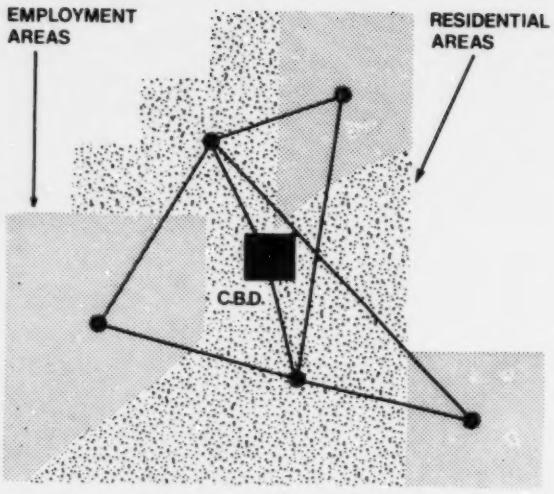


FIG. 8
DESIRE LINES - HOME TO WORK TRIPS

The travel desires can be translated to an arterial and collector roadway network by following some basic considerations and guidelines including:

- The internal roadway network should enable internal trips to be made with minimal additional impact on the adjacent highways.

- Major arterial roadways as a general rule-of-thumb, are spaced 1.5 km apart. In some smaller communities the combined spacing on the arterial/collector system is .8 km. These roadways should be continuous and provisions should be

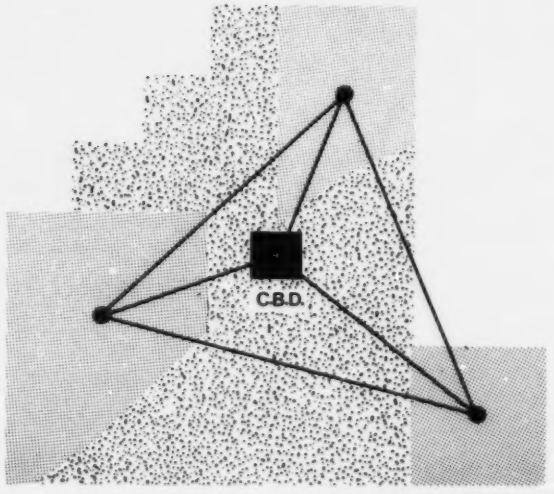


FIG. 9
DESIRE LINES - TRUCK TRIPS

made to extend them beyond the limits of the community.

- Arterial roadways should be located to serve principal truck origins and destinations. It should be noted that all truck routes are arterials; however, not every arterial roadway need necessarily be a truck route.

- Good linkages should be provided to connect residential areas with industrial and commercial areas and the regional highway system.

- Access points along arterials should be minimized and, wherever possible, should not be any closer than 400 m apart.

- As a general rule, highways should only be intersected by other highways or arterials. Similarly, arterial roadways should only be intersected by other arterials or collector roadways, and collector roadways should only be intersected by other collectors and local roadways.

- Normally, roadways which form part of the regional highway and secondary system should be classified as arterials within the community.

2.7 IDENTIFY POTENTIAL PROBLEM AREAS

During preparation of the plan, future potential problem areas may be evident. For example, additional right-of-way may be necessary in existing developed areas of the community. Arterial facilities which will accommodate truck traffic may be required adjacent to residential development, thereby possibly requiring noise buffering or, if this is not possible, requiring either the relocation of the truck route or the area it services. Topographic constraints may restrict the alignment, continuation or construction of arterials. Traffic associated with future development may aggravate existing transportation concerns. Since the simpified planning process presented its iterative, the potential problems should be identified, and solutions should be examined to resolve them or to modify the proposed roadway plan to eliminate them. The solutions may include developing alternative directions for growth or examining ways of dealing with the potential impacts of the plans, such as establishing one-way operations, installation of traffic signals and other traffic control devices.

2.8 PREPARE A TRANSPORTATION PLAN

The transportation plan itself should, as a minimum, consist of a plan of the municipality indicating the proposed growth areas and the proposed arterial system

required to service it. Desirably, collector roadways should also be indicated so as to define a general outline for the collector roadway connections in the municipality. In addition to the plan, it is also suggested that a brief written report be attached explaining the community goals and objectives, plan policies and guidelines, growth assumptions and plan components.

A typical transportation plan is presented in Figure 10.

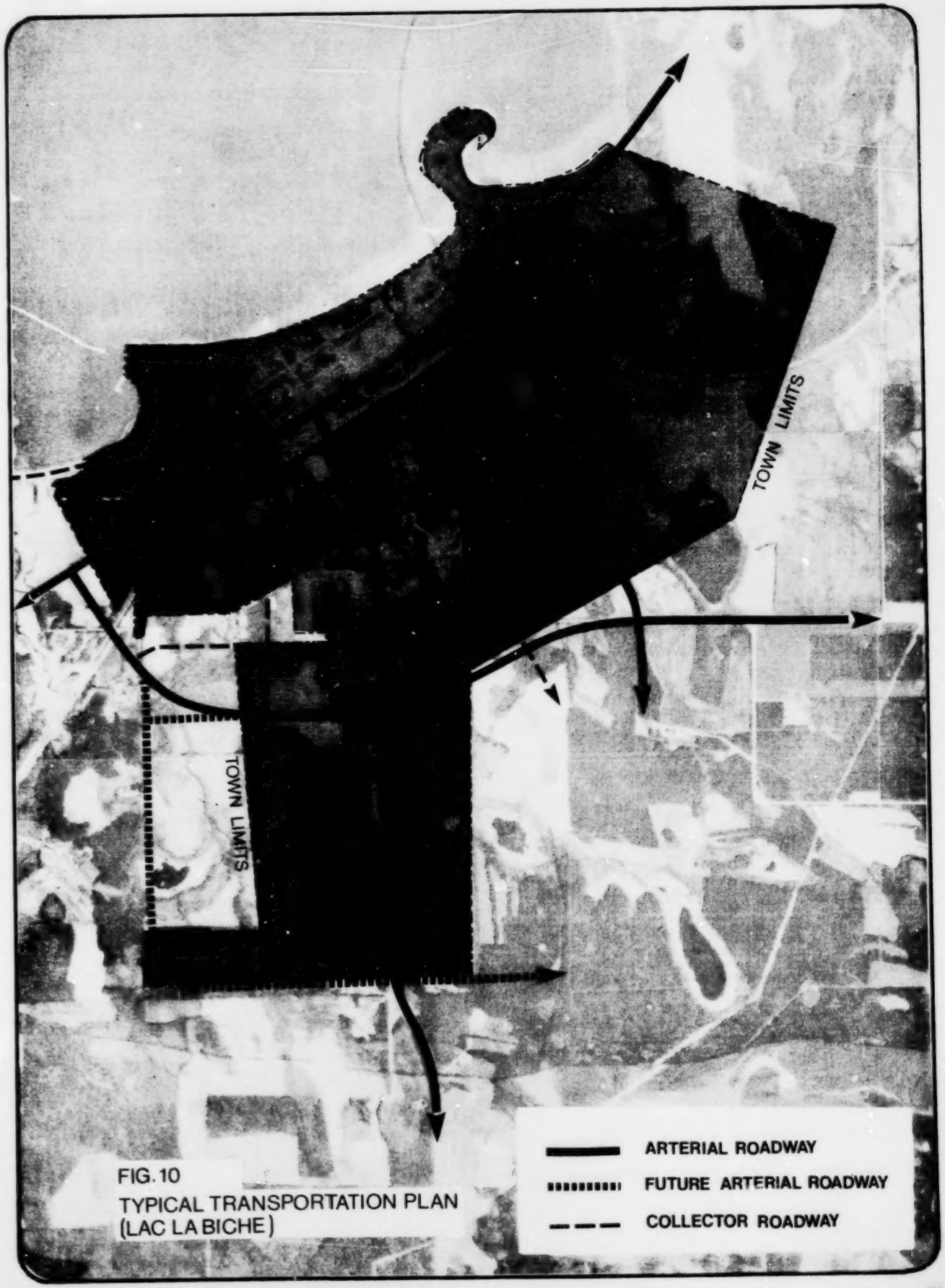


FIG. 10
TYPICAL TRANSPORTATION PLAN
(LAC LA BICHE)

3. MAJOR FACTORS TO CONSIDER IN PREPARING A TRANSPORTATION PLAN

When preparing a transportation plan, there are some areas which should be given special consideration. These are discussed briefly below.

3.1 ROADWAY CLASSIFICATION EVOLUTION

Historically, when a new community has developed, the initial need usually was to provide basic transportation access to each property. The easiest, most versatile and most economic way of providing this access has been, and usually still is, to construct a simple roadway grid which provides access to each property. Often, there has been little or no distinction between the various roadway components of the grid with respect to width, grade, pavement structure, etc.

This roadway system works well when traffic volumes are low on the individual roadway components of the grid and when the land use categories within a given area are generally uniform. However, as a community grows, redevelopment occurs and the function of some of the original grid roadways change. Unfortunately, since there was little distinc-

tion between the actual design of the various roadways in the grid, those which are most heavily used are those which best satisfy the new traffic demands, whether or not this is compatible with adjacent development.

Accordingly, as a community grows, existing roadways within the built-up area assume new roles as traffic arteries. Unfortunately, in many cases, these roadways were not designed for this purpose. In addition, adjacent land uses are usually not compatible with the new function which the roadway must perform. As a result, traffic problems ultimately develop and the community is faced with disruptive and expensive solutions to resolve these problems.

It can be seen, therefore, that a roadway classification system will evolve naturally, even if no specific attempt is made to design such a system. Accordingly, to prevent problems from arising in the future, there is a need to recognize a roadway classification or hierarchy at an early stage in the development of a community.

3.2 FUNCTIONAL SYSTEM OF ROADWAY CLASSIFICATION

For transportation planning purposes, as well as for design purposes, roadways are most effectively classified by one or both of two functions: to provide mobility or to provide land access. To provide mobility, disruptions to traffic flow must be minimized; for land access low speeds are desirable. For example, highways should provide a high degree of mobility. To promote this, access points to the highway should be kept to a minimum. When direct local access is permitted on these facilities, hazardous conditions can result from the conflict between the through highway traffic and the local access traffic.

In defining a functional classification for all principal roadways in a municipality, design criteria can be applied to encourage the use of the road as intended. Design features that can convey the level of functional classification are alignment, spacing of intersections, frequency of driveways, building setbacks, grade standards and traffic controls.

Although there are numerous ways in which to classify roadways functionally, the most widely used method categorizes roadways as arterials, collectors and locals. Although numerous subclassifications of these roadways are possible, the principal characteristics of each are:

Arterials - Roadways for Moving Traffic

Arterials are intended to move large volumes of traffic with minimum interruptions. There are two types of roadways with arterial functions. **Rural arterials** often serve as major highway routes connecting towns and cities in the province. Adjacent to many small communities, these roadways form part of the highway system.

Urban arterials serve as major routes within an urban area, primarily connecting residential and employment areas, and serving as truck routes. In many small communities, few roadways are identifiable as urban arterials.

Generally speaking, arterial roadways should not provide direct access to adjacent land uses due to their prime function of traffic movement. Intersections should generally be restricted to other arterials or collector roadways. Some general functions of arterial roadways are outlined in Table 1.

Table 1

ARTERIAL FUNCTION

FUNCTION	RURAL ARTERIAL	URBAN ARTERIAL
MOBILITY	• primary highway system • intra-provincial trips between towns and cities • longer distance trips	• trips between residential and employment areas in community • truck routes
ACCESS	• 0.8 to 1.6 km intervals • on low volumes roads driveway access to individual properties may be provided	• 200 to 400 m intervals • only collectors and other arterials should intersect • generally no direct access to individual properties

Collectors - Roadways for Moving Traffic and for Providing Land Access

These roadways are usually **designed to collect traffic from local roadways and carry it to arterial roadways.** They provide for both traffic movement and for land access and can also be classified as both urban or rural. The secondary roadway system in the province can be classified as a **rural collector system.**

Generally speaking, collector roadways are more frequent, shorter in length and less continuous than arterial roadways, and serve lower traffic volumes at lower speeds. Some general functions of collector roadways are outlined in Table 2.

Table 2

COLLECTOR FUNCTION

FUNCTION	RURAL COLLECTOR	URBAN COLLECTOR
MOBILITY	• secondary highway system • access to and from regional commercial centres • access between farming districts • some through traffic from secondary origins and destinations	• collect traffic from a neighbourhood and distribute to arterials • limited through traffic
ACCESS	• on low volume roads direct driveway access to individual properties is provided	• on low volume roads direct property access is provided

Locals - Roadways for Providing Land Access

These roadways are **designed principally for providing direct access to abutting properties.** Since they are not designed for moving large volumes of traffic, they are generally not very continuous, and provide for on-street parking. Ideally, these roadways should only connect to other locals or collector roadways and operating speeds should be low.

As mentioned previously, the access function of a roadway detracts from the movement function and vice versa. Thus, the classification of roadways into systems (arterial, collector, local) is essentially a determination of the degree to which access functions are to be emphasized at the cost of the efficiency of movement or discouraged to improve the movement function. The general relationship of functionally classified systems in serving mobility and land access is illustrated in Figure 11.

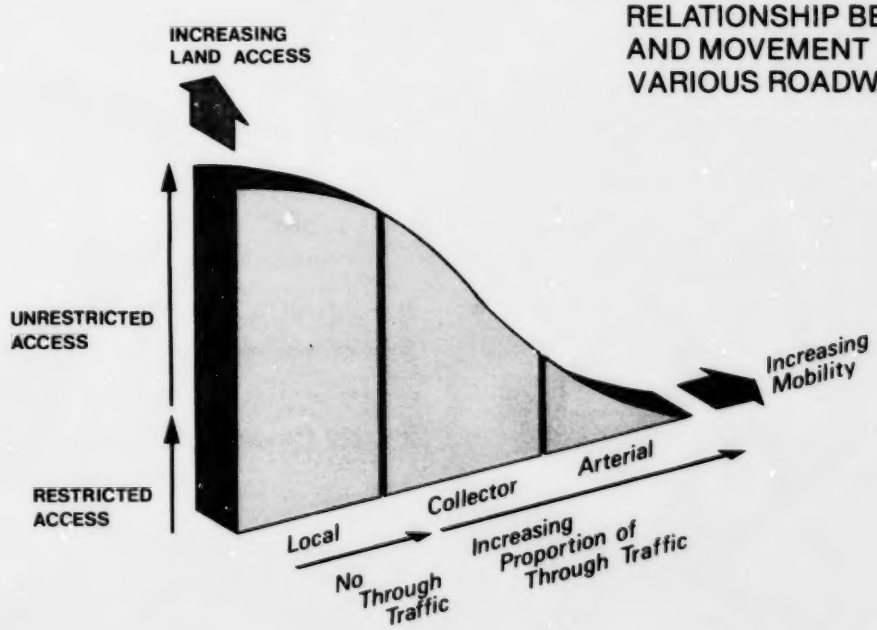
Special Purpose Roadways

Although not classified within the generally accepted roadway classification system, other roadways exist which serve special purposes, the most important of which are frontage or service roads. A service road is a local roadway, auxiliary to and located parallel to an arterial highway to serve abutting property. In this sense, it acts as a special purpose local roadway.

Primary highways are also special roadways which may require additional right-of-way or access control. Alberta Transportation should be consulted regarding the specific needs of these facilities.

FIG. 11

RELATIONSHIP BETWEEN ACCESS AND MOVEMENT FUNCTIONS OF VARIOUS ROADWAY TYPES



3.3 MAN-MADE OR NATURAL BARRIERS

Often in a community, features exist which act as barriers to traffic circulation, such as:

1. Highways
2. Railways
3. Rivers
4. Ravines

Of these, highways and railways are usually the most predominant. When planning growth directions for the community, careful consideration should be given to the transportation implications of expanding or growing across these barriers for a number of reasons:

1. Safety Implications — With grade level rail and highway crossings, there will be a constant need to upgrade the type of protection at these locations as traffic volumes or train movements increase. In addition, crossing delays will increase.

2. Accessibility Implications — Natural or man-made barriers can provide considerable inconvenience for local traffic as travel to destination points on the other side of these barriers can be made only at available crossing points. The frequency of crossings is always minimized for safety and cost reasons. As a community grows, these "unforeseen" crossings usually become the major transportation problem.

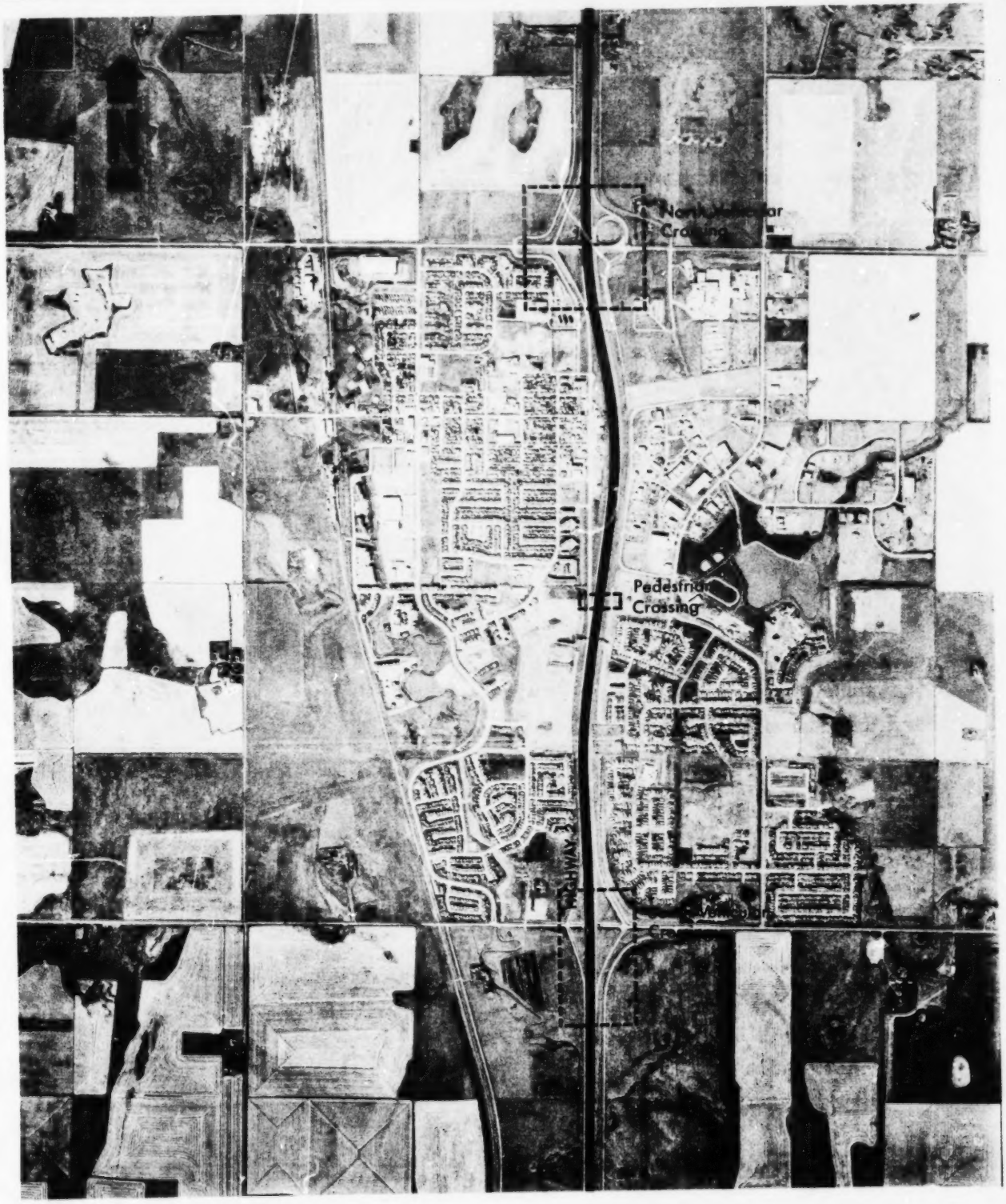
3. Cost Implications — To provide adequate transportation linkages across these barriers, significant additional costs may be incurred for the construction of bridges, overpasses or interchanges. Although these costs may not be incurred immediately as existing crossings or at-grade intersections may suffice, they may be incurred in the long term. A small community will not likely have the financial capability to construct these crossings.

3.4 CONTROL OF ACCESS TO ARTERIALS

Once the arterial routes have been identified, the transportation plan should recognize the need to minimize access to these roadways, particularly in the new areas, in order to preserve their principal functions for traffic movement. In older, established areas it may not be possible to control access to the same degree. **The intent of a long-range plan is to gradually evolve the desired system as time and money permits.** It is not intended to "retrofit" all of the existing roadways in a community.

Access can be regulated by:

- Developing a general guideline as part of the transportation plan that direct land access will not be permitted to identified arterial road-



The above photo illustrates how the Town of Airdrie is developing an entirely new area to the east of Highway 2; a major barrier. Note that only two roadways are available for vehicles to cross Highway 2, spaced approximately 3.2 km apart. A pedestrian crossing is located about 1.6 km south of the north crossing.

ways unless there is no alternative. Future subdivision or development plans should take steps to ensure that access is provided from available adjacent collector and local roadways. Where direct access must be provided, the number and frequency of access points should be minimized. Where commercial land uses are designated adjacent to highways, access to these developments should desirably be provided with a service road or a collector road parallel to the highway.

- Service roads (Fig. 12) are utilized to intercept driveways of commercial, industrial and residential establishments along an arterial and to provide for local traffic service. Intermittent crossconnections between the through traffic lanes and the service roads provide the means of access between the through roads and adjacent property. Thus, the through character of the arterial is preserved and is unaffected by subsequent development of the roadside. However, special care must be used in the design of service roads to avoid poor intersection design.

- An alternative to utilizing service roads, but achieving the same

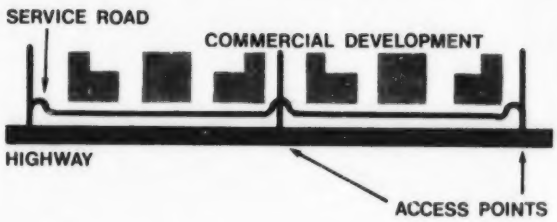


FIG. 12
THE SERVICE ROAD CONCEPT

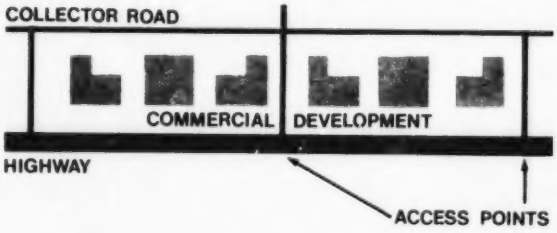


FIG. 13
THE PARALLEL COLLECTOR ROAD CONCEPT

FIG. 14
ROADWAY HIERARCHY

results is to construct parallel collector roadways (Fig. 13). This concept is similar to service roads, except that the highway commercial development is located between the highway and the collector road. This concept still permits a business to have the necessary highway exposure. However, it has the added advantages of permitting double frontage on the roadway, thereby reducing servicing costs. It also allows for greater storage length at the access points, thereby minimizing traffic conflicts and increasing capacity at these intersections.

- Ensuring that only collector and arterial roadways intersect with other arterial roadways and that these intersections are suitably spaced. These intersections should be spaced 200 m to 400 m apart, depending on the specific circumstances. Although this cannot always be accomplished in the existing developed part of the community, this can be a requirement for new areas. The general concept of roadway hierarchy intersection is that roadways should only intersect with other roadway categories one level up or down on the hierarchical order (Fig. 14).

One of the principal shortcomings in existing communities has often been not recognizing the need and taking steps to limit access to designated arterial roadways.

3.5 LAND USE CONSIDERATIONS

Locating Schools and Recreation Areas Next to Arterial Roadways

Due to the high volume, relatively high speeds, and concentration of trucks on arterial roadways, attempts should be made to ensure that land uses which are associated with pedestrians are located away from these roadways. If this cannot be avoided in developed areas, there are control systems which can be installed to minimize conflicts between pedestrians and vehicles. However, advice should be obtained as to which device would be best suited and most cost effective for the particular site.

Expanding Across Major Transportation Barriers

As discussed previously, this should be avoided where possible. However, if expansion is required across railways or highways, etc., these land uses should consist of low traffic generators such as recreational developments or bulk storage industrial uses.

Locating Industrial Areas Within Residential Areas

This should be avoided, where possible, as it is undesirable to have trucks pass through residential areas. As a longer term objective these non-compatible land uses in a community should be phased out.

3.6 TRAFFIC CONTROL

In preparing a transportation plan, potential locations for traffic signals and other control devices such as stop and yield signs should be identified. Traffic signals are usually only required at arterial-arterial intersections and sometimes at arterial-collector intersections. At these latter locations, a more judicious control of access should be exercised. However, it is unlikely that traffic signals would be justified in most small communities in the short term.

If signalization is required, it is most likely needed to provide for pedestrian or vehicular crossing of an arterial facility. Most often, it is for safety reasons that a signal is installed and the advice of Alberta Transportation or a qualified consultant should be considered prior to implementation.

3.7 CENTRAL BUSINESS DISTRICT

This is the most active part of a small community from a traffic perspective and, as a result, often presents many problems.

Usually there is a main business street where much of the traffic is concentrated. This main street often provides direct access to adjacent land uses or to numerous local roadways from which business development takes access. As a result, the transportation plan should be constructed to minimize the through traffic role of the main business street. Access to the main business street should be as direct as possible via arterial roadways, without forming a direct extension of the street. Continuity of the business street beyond the central business area should be avoided, where possible.

If the transportation plan can be developed to minimize the use of the Main Street for through traffic movements, problems with traffic circulation and on-street parking — which are common in the central business areas — may be avoided.

Parking

Many central business districts in Alberta have angle parking along the main street. From a traffic operations perspective, this is not desirable because the parking maneuvers interfere with traffic circulation. The reason given most often for the need for angle parking is that it is required to serve the parking demands generated by the downtown merchants. However, comprehensive parking studies undertaken to date indicate that the on-street parking supply in most communities is adequate when the entire central business district

is considered as a whole. Some parking deficiencies may exist on individual block faces but an adequate supply usually can be found within a very short distance.

The parking deficiencies can usually be remedied by corrective measures such as:

- Encouraging employees not to tie up on-street parking stalls, especially store front customer parking.
- Utilizing vacant lots to create off-street parking areas.
- Time limits established i.e., 1 hour or 2 hour restrictions in certain zones.

3.8 SELECTING ROADWAY ALIGNMENTS

In selecting alignments for new arterial roadways, the following should be considered:

- Topography
- Soil Conditions
- Property Ownership
- Ease of Implementation

Where possible, arterial roadways should not be developed with grades exceeding five to six percent. As a result, alignments chosen for these roadways will be dictated somewhat by local topography. In general, the alignments chosen should follow a routing where the natural terrain minimizes the grades. In situations where the topography does not permit reasonable grades within the general area where an arterial is required, extra costs may be incurred to construct the roadway (i.e., for additional earthwork to bring grades to desirable levels). In mountainous areas these grade guidelines do not apply. However, grades over 8 to 9 percent generally will cause problems during winter operating conditions.

Poor soil conditions may cause additional costs for roadway construction as much of the soil must be removed from the roadway and good material must be hauled in. If possible, arterials should be aligned to bypass poorly soiled or drained areas. At the planning stage it is not usually possible to identify areas with poor soil conditions unless the conditions are totally visible and obvious. These are normally investigated at the functional planning level.

Property ownership should also be considered in selecting roadway alignments. Usually, selecting alignments which minimize the number properties under different ownership is an advantage in securing the rights-of-way required. Again, a title search is not normally done at the planning level and only the obvious property owners can be identified. These conditions are also looked at in more detail at the functional planning level.

Sometimes the adjacent rural municipal grid system provides an advantageous alignment for arterial roadways. An existing right-of-way (usually about 20 m) is available and is suitable for providing access for the short term. Additional right-of-way for full arterials standards can then be assembled to meet

future requirements. In existing areas right-of-way can be acquired at the Area Structure Plan level or as the adjacent properties are redeveloped.

In general, care should be taken in the selection of alignments to ensure that roadways can be constructed at a cost which is within the community's financial capabilities. Poor soil conditions, land ownership and topography can increase the cost of obtaining rights-of-way and constructing the roadway.

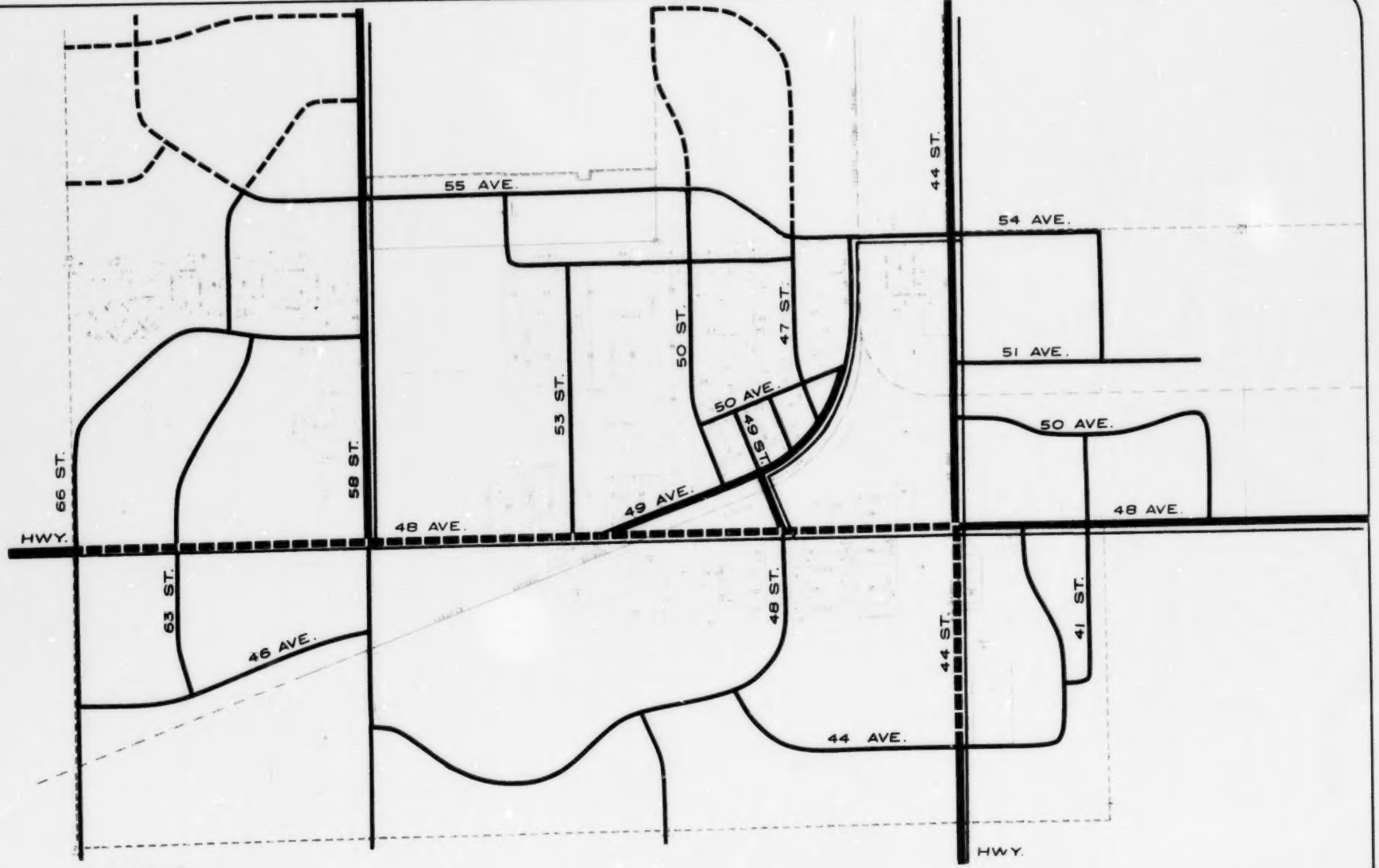
A transportation plan outlines the function and general alignment for collector and local roadways. These alignments are not critical and can be varied at the Area Structure Plan and subdivision plan stages to accommodate a particular subdivision plan.

3.9 LOCATING TRUCK ROUTES

It is desirable through the development of a transportation plan to designate certain roadways for truck traffic. Concentrating large trucks on specific higher standard roadways is usually safer and less disruptive to a community than allowing trucks to randomly filter through the community. In addition, an early decision on truck routes allows development decisions (especially the location of residential areas) to be made with confidence.

The Figure on the opposite page illustrates how a truck route system can be incorporated into an overall transportation plan. Generally speaking, the following guidelines should be followed in selecting truck routes:

- A truck route system should ensure that routes are available for trucks to travel to/from all industrial and commercial areas with connections to the highway network as well.
- Truck routes should be located away from schools, hospitals, recreation areas and residential land uses where possible.
- Truck routes should be located on designated arterial roadways.
- The truck routes should be approved by bylaw and enforced.



TRUCK ROUTES AS PART OF A TYPICAL ROADWAY HIERARCHY (REDWATER)

3.10 TRANSIT CONSIDERATIONS

Transit service is a type of urban transportation service whereby the travel needs of several persons are accommodated in a single vehicle. In transportation planning, transit service is regarded in two perspectives: to reduce the amount of travel by automobile and to provide mobility to those who wouldn't otherwise have it. In most communities with populations of less than 25,000 the latter perspective is usually applicable; that is, transit service provides transportation service to those who require it but have no other means of providing it, such as the elderly, young, handicapped or low income groups and it acts as a supplemental service to individuals who desire it.

In general, there is only limited potential for transit service in communities with populations of less than 10,000. Some of the transit options which may be considered include:

Conventional Transit, whereby a system operates on a fixed route and schedule.

Demand-Responsive Transit, whereby the system responds to a specific request for service only. Some examples of this include a dial-a-bus system, a shared-ride taxi system or a hybrid combination of the two.

Subscription Transit, whereby a pre-programmed door-to-door service is provided. This would include services such as regular weekly shopping trips from a senior citizens home to the C.B.D.

Cooperative Transit, whereby several individuals cooperate in fulfilling travel desires. This type of transit would include a van-pooling system, whereby a company would purchase a van for use by several employees in making the home-to-work trip or, in its simplest state, a car pool among several neighbours.

It should be noted that although all of the above systems are possible in every community, the costs for providing these services are substantial. Therefore, before any system is implemented in an urban area, it is important to carefully review and identify the need for the service, evaluate the potential ridership and available options and to cost the alternatives. Several publications are available from Alberta Transportation to assist with this excercise, including the "Ready-Reckoner" transit demand and cost estimator for small communities, and transit evaluation studies of several communities.

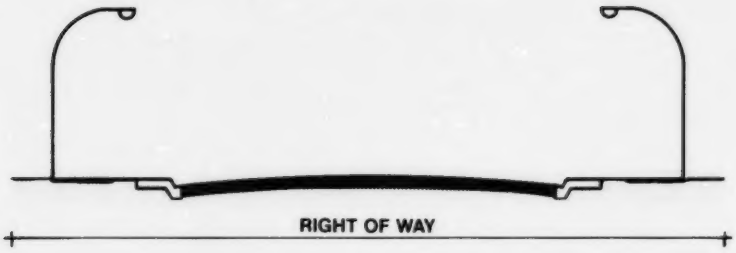


FIG. 15
THE 'URBAN' CROSS-SECTION (Underground Drainage)

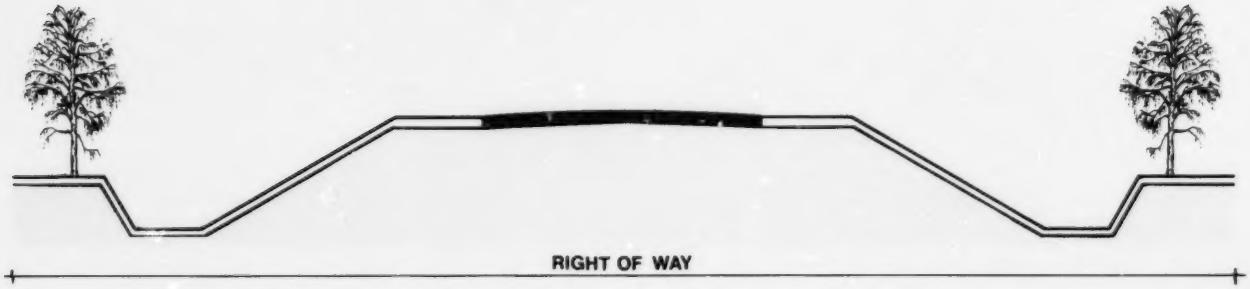


FIG. 16
THE 'RURAL' CROSS-SECTION (Surface Drainage)

4. ROADWAY STANDARDS

Roadways can be constructed to varying standards to meet the requirements of a particular municipality. The standard which is selected will depend on the expected use of the facility as well as the financial capability of the community. A brief description of the criteria which are used to establish design standards, along with some typical design standards that have been used in various communities in Alberta, follows.

4.1 UNDERGROUND vs. SURFACE DRAINAGE

One of the principal cost factors for a roadway is the method of accommodating water runoff from the roadway surface. The first and more expensive method is to provide an underground stormwater drainage system, which involves the construction of concrete curb and gutters, and the installation of catch basins and underground pipes for the disposal of the water runoff. This type of roadway cross-section is normally referred to as "urban" (Fig. 15).

Alternatively, the roadway drainage can be accommodated by surface swales or ditches. This system is less expensive to construct; however, it requires more right-of-way for the

roadway. Normally, this roadway cross-section is referred to as "rural" (Fig.16).

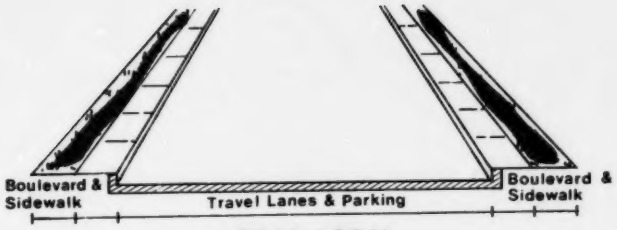
The decision to design to urban or rural design standards is largely an economic one. In general, where land costs are high, it is more feasible to reduce right-of-way requirements by constructing an urban cross-section.

4.2 ARTERIALS

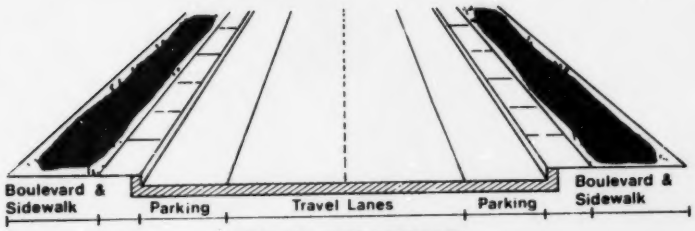
Figure 17 illustrates some typical roadway standards for arterials, collectors and locals. A brief description of the principal characteristics of each roadway-type is provided in the following sections.

Principal characteristics of arterial roadways are:

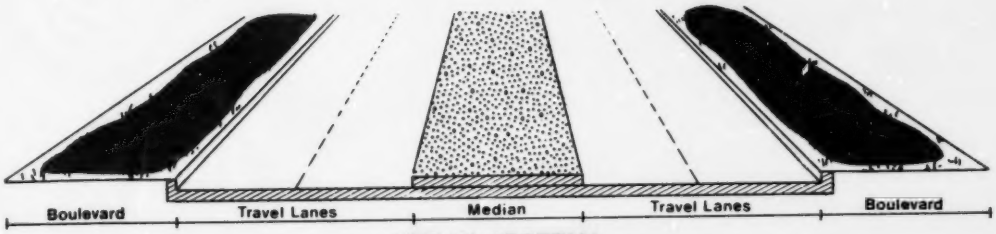
- The purpose of the roadway is to provide safe and efficient movement of vehicles between major traffic generators;
- All classes of vehicles use the roadway, including large trucks;
- Traffic volumes are usually over 5,000 vehicles per day;
- Traffic speeds are normally 50-70 km/h;
- Access is predominantly restricted to intersections or to major traffic generators, and there should be little residential frontage;
- Where high left-turn manoeuvres are present, a centre median of 5 m should be provided along with channelization (turning lanes) at all major intersection locations;
- The total right-of-way width is dependent upon the requirement for:
  - noise attenuation
  - utilities
  - sidewalks
- For arterials of a rural cross-section, the right-of-way width is dependent upon the depth and width of the ditch, necessary to provide adequate drainage as well as the travel lane requirements, shoulder width and median section;
- A hybrid urban/rural cross-section which features a raised median and open ditches is often used for four-lane divided roadways where the right-of-way is restricted.



URBAN LOCAL



URBAN COLLECTOR



URBAN ARTERIAL

	URBAN LOCAL		URBAN COLLECTOR		URBAN ARTERIAL
	Residential	Industrial	Residential	Industrial	
Boulevard	1.25 - 2.25	2.25 - 2.50	2.75	3.0 - 5.0	4.75 - 7.0
Sidewalk	1.25		1.25 - 1.50		1.5
Parking			2.50	2.50 - 2.75	
Median					5.0 - 7.0
Travel Lanes	11.0	11.5 - 13.5	3.5 - 3.75	3.5 - 3.75	7.0 - 7.5
Right-of-way	16.0 - 18.0	16.0 - 18.5	20.0 - 21.0	18.0 - 23.0	29.0 - 36.0

FIG. 17
TYPICAL ROADWAY STANDARDS
(All measurements shown in meters)

4.3 COLLECTORS

Principal characteristics of collector roadways are:

- The roadway should collect traffic from local streets and distribute it to arterial roadways;
- They should be located as to not encourage through traffic;
- The majority of vehicles using the road are passenger vehicles with some commercial delivery vehicles; collector roadways can be used as bus routes;
- Traffic volumes on collector roadways are generally between 1,000 and 5,000 vehicles per day;
- There are few access restrictions on collector roadways; properties can have direct access to the roadway;
- Industrial collector roadways must be designed for truck movements. A carriageway width of 13.5 m is recommended in order to permit turning movements to be made with a minimum interference to opposing traffic.

4.4 LOCALS

Principal characteristics of local roadways are:

- The roadway should not be used for through traffic, the main purpose being to provide direct access to residential, business or commercial lots;
- The majority of vehicles using this roadway are passenger vehicles with some commercial and industrial delivery vehicles;
- Traffic volumes are less than 1,000 vehicles per day;
- Traffic speeds should be at or below 50 km/h;
- There are no access restrictions; all properties and residences may have direct access to the roadway;
- Where parking along local streets is required, a parking lane of 2.50 m should be provided;
- Industrial local roadways should have a minimum travel width, including parking lanes of 11.5 m. This is based upon the minimum turning requirement for large trucks.

4.5 SPECIAL PURPOSE ROADS

As indicated previously, a special purpose road, such as a service road, is sometimes used to control access along an arterial facility. The principal characteristics of these types of roadways are:

- The roadways should be designed specifically for the individual needs of the particular application;
- Service road access points should be spaced at a distance of 200 to 400 m along an arterial roadway;
- Adequate bulbing should be provided at the access points to minimize turning movement conflicts for trucks in particular;
- Where possible left-turn storage bays should be provided for turning movements onto the service roads access points.

A typical bulbing design is indicated on Figure 18.

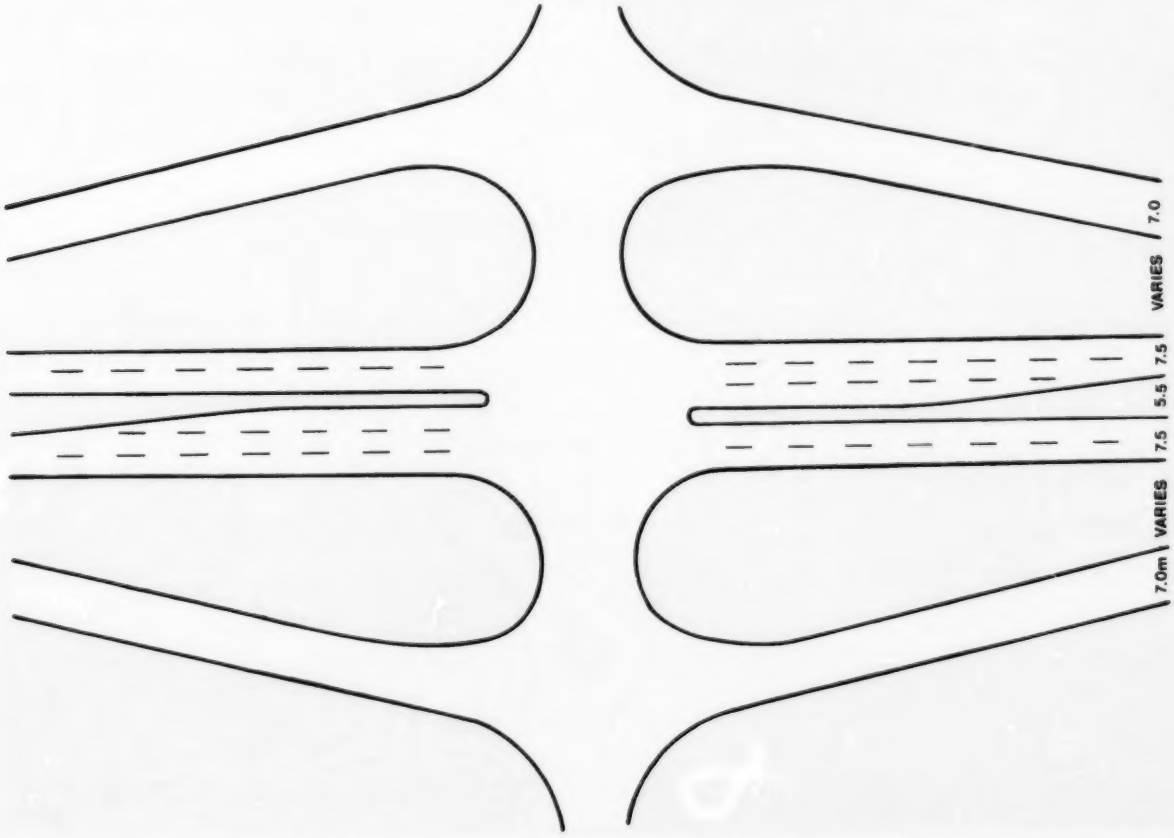
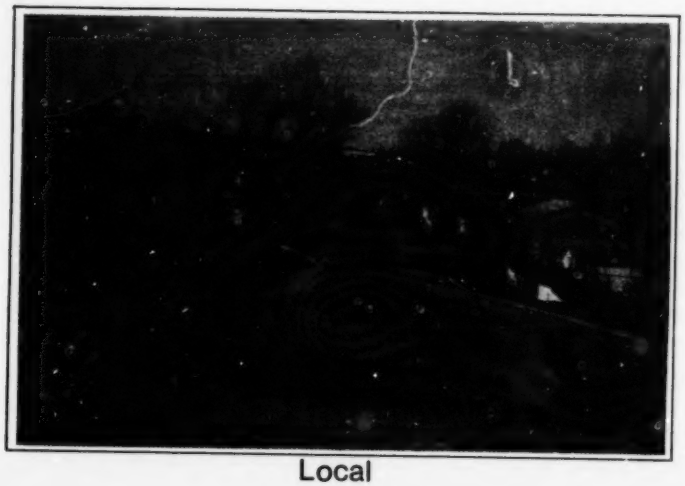
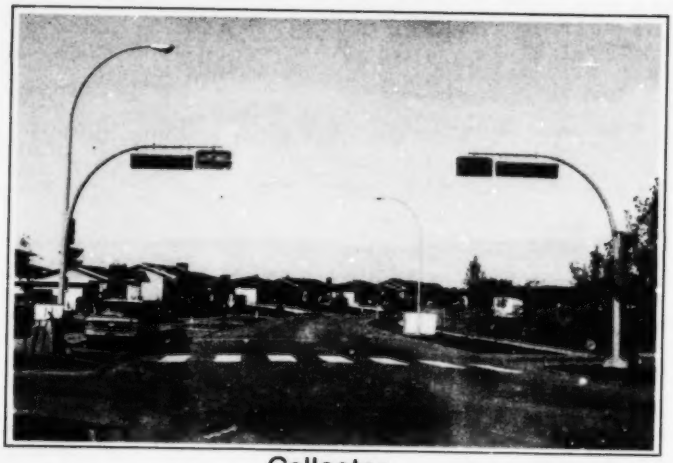


FIG. 18
SERVICE ROAD BULBING REQUIREMENTS



Local



Collector

Arterial

TYPICAL ARTERIAL, COLLECTOR AND LOCAL ROADWAY STANDARDS IN SMALLER ALBERTA MUNICIPALITIES

4.6 SELECTION OF AN APPROPRIATE STANDARD

Assuming a new roadway classification has been selected for a particular section of roadway in a community, whether it be the upgrading of an existing roadway or the construction of a new roadway facility, the availability of land is usually a major constraint. As such, it is important to assess various geometric cross-section alternatives in terms of their role in filling an immediate need and in being flexible, such that the roadway can expand in the future without the purchase of additional land for roadway right-of-way, requirements. In the majority of cases, roadways can be upgraded from rural facilities to urban facilities within the same right-of-way if sufficient land is set aside initially. This is particularly critical for arterial roadways.

Although numerous alternative cross-section standards are presented in this publication, with carefuly planning, the alternative cross-sections for arterial roadways can be accommodated within one right-of-way width as illustrated on Figure 19. The figure indicates that a minimum right-of-way of 30 m for arterial roadways will initially accommodate a two-lane rural cross-section and ultimately, if and when demand warrants it, either a four lane divided or undivided cross-section.

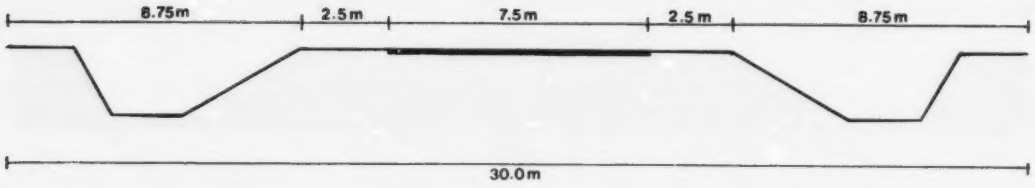
4.7 ROADWAY COSTS

Current Funding Policies

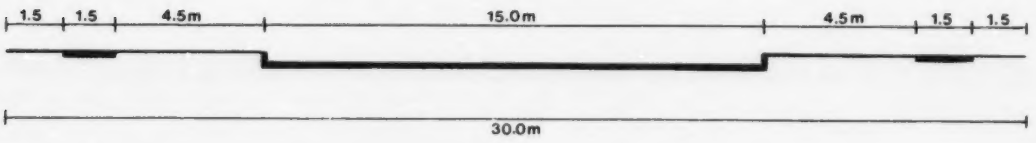
A number of different funding policies are available to communities when considering roadway improvement programs. In general, major highway facilities and secondary roads are cost-shared between the Province and the local authority. The upgrading or construction of any other roadways is the responsibility of the community. These can be funded through tax assessments, development agreements, or a local improvement tax.

Major Highway Facilities: The Province of Alberta will generally fund the improvement or upgrading of a major highway facility, including right-of-way acquisition when it is felt that the facility requires upgrading or expansion and there are no viable alternatives.

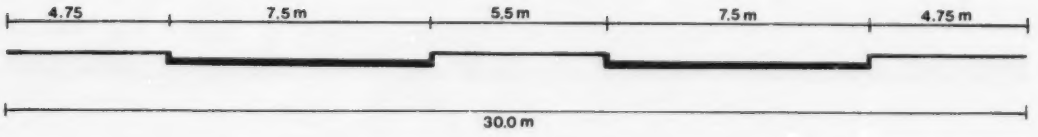
Town Grants Town grants are provided to smaller communities on a per-capita basis to undertake roadway improvement programs. These projects may include new roadway construction programs or roadway improvement projects.



STAGE 1 - 2 LANE RURAL CROSS-SECTION



STAGE 2 - 4 LANE UNDIVIDED URBAN CROSS-SECTION



STAGE 2 ALTERNATIVE - 4 LANE DIVIDED URBAN CROSS-SECTION

FIG. 19
SUGGESTED MINIMUM ARTERIAL R.O.W. REQUIREMENTS

Current Roadway Costs

As in the case of geometric design standards, the cost of constructing any particular roadway type will vary. This variance is due to a number of factors including length, terrain, utilities, etc. In addition, location can have a dramatic impact upon the costs of materials and labour. However, in order to gain an appreciation of roadway costs, Figure 20 graphically illustrates the range of costs for the construction of local, collector and arterial roadways. These costs have been based upon recently completed roadway projects and do not include costs for drainage, storm sewers or right-of-way acquisition. Costs indicated in this figure should be used as a guide to gain an appreciation of roadway construction costs. For example, a four-lane divided arterial roadway would vary in cost from $1.2 million per km for a rural cross-section to $1.75 million per km for an urban cross-section.

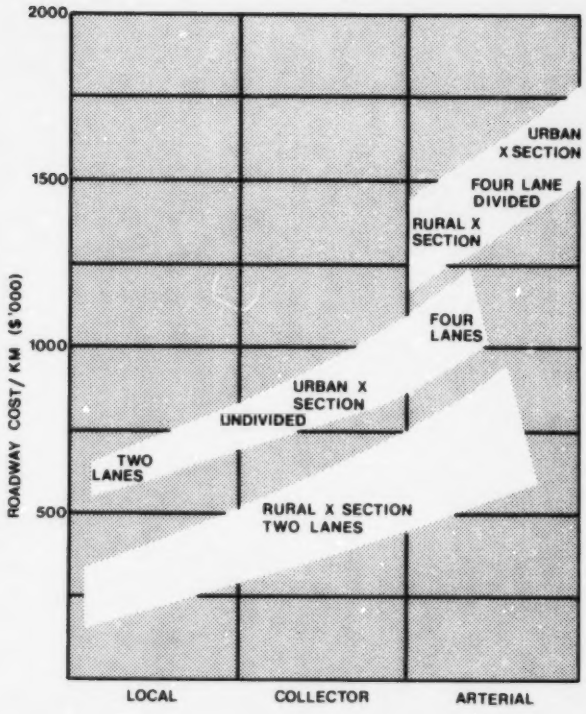


FIG. 20

COST ESTIMATES FOR ROADWAY CONSTRUCTION (1982 DOLLARS)

5. IMPLEMENTATION OF THE TRANSPORTATION PLAN

5.1 GENERAL

In order for the transportation plan to be effective and meaningful **it must have some form of formal recognition by the municipality. The best way to do this is to have the plan adopted as a by-law, either on its own or as part of a more comprehensive General Municipal Plan.** As a general rule, the part of the plan which is adopted formally should be as simple as possible. All that is normally required to be formally adopted is the exhibit of the plan itself. Any backup documentation prepared does not necessarily have to be included. This information can be bound and preserved as background information.

This formal recognition is important for two reasons: it informs the general public and other interested parties of the growth intentions of the municipality and its associated infrastructure requirements; and it becomes part of the requirements to which any new development in the municipality must adhere, thereby insuring its implementation in the long term.

The most important aspects of the plan are that it designates right-of-way requirements for future roadways and that it indicates the proposed relationship between the future

land uses and the transportation system. Also, it acts as a guide for planning new subdivisions in the community.

Although the plan is adopted by formal resolution of the municipal council, it does not mean that the plan will be inflexible to change and does not require frequent modifications. The level of detail presented in the plan is such that it acts only as a guideline for planning to insure that the principal elements of the plan are followed. It is not intended to replace detailed planning and transportation planning at the Area Structure Plan or Neighbourhood Structure Plan level. As a general rule, the following characteristics of the adopted plan should be noted:

- The transportation plan is a guide for the future direction and allocations of growth in the community.

- The functional alignments indicated for the arterial roadways should be adhered to as closely as possible. In general, if the alignment of the roadway remains within 200 m of the designated route, no major problems can be expected. If the alignment varies by more than this then the entire plan should be reviewed to establish the impact of the realignment.

- The alignment of designated collector roadways in new development areas can vary substantially. However, the number and locations of collector intersections with arterial roadways should remain the same. When realigning collector roadways, potential use as future transit routes should be noted.

- When a change in land use allocation in a community occurs the overall arterial roadway plan generally does not change. However, the function of the roadway immediately adjacent to the modifications usually changes along with the geometric configuration of the roadway or treatment adjacent to the roadway.

Establishing Roadway Improvement Priorities

An integral component of adopting a plan includes the establishment of a priority improvement schedule. This schedule would generally take into account the financial capability of the municipality to pay for the designated improvements. Table 3 outlines a typical roadway priority improvement plan for a community. As can be noted, the table simply lists the major roadway improvements in the municipality in order of priority. This priority plan should be reviewed on an annual basis and appropriate adjustments made to reflect current conditions. It should be noted

that the improvement program is tied into a specific population horizon and that the facilities indicated are built as the need actually arises.

5.2 REACTING TO CHANGE

Every municipality experiences some degree of change with time. Therefore, a well prepared transportation plan should be able to react to a certain amount of change without the need for major revisions. The degree to which a plan may require modifications will depend upon whether minor or major changes have occurred in the municipality. As a guide, the following items can be considered to be either of a minor or major category.

Table 3

TYPICAL ROADWAY STAGING PROGRAM
(10,000 POPULATION LEVEL)

PRIORITY	ROADWAY LINK	DISTANCE	ESTIMATED COST (1982 Dollars)
1.	Pave 2 lanes of Merleson Road between 1st Street and 6th Street	1.0 km	$ 1,000,000.00
2.	Upgrade Franton Road between Westar Avenue and Eastgate Avenue from 2 lane rural section to a 4 lane undivided urban section.	0.5 km	$ 800,000.00
4.	Pave 4th, 5th and 8th Avenue in the Sundance Subdivision to 2 lane industrial collector standards	3.5 km	$ 2,300,000.00
5.	Construct Rimar Avenue between 12th and 15th Street to a paved 2 lane rural standard.	1.6 km	$ 1,600,000.00
8.	Reconstruct the intersection of Koll Road and Harwood Drive	N/A	$ 150,000.00
	TOTAL COST OF PROGRAM		$ 4,850,000.00

Minor Change

- A change in the overall density of population or employment in a particular area of 20 percent or less.
- A change in the allocation of the population or employment within a small given area.
- A change in the proposed alignment of a collector roadway.
- Generally, a change in the proposed alignment of an arterial roadway of 200 m or less.
- A change in the proposed location of an intersection of a collector roadway with an arterial of 100 metres or less.

Major Changes

- A change in the proposed alignment of an arterial roadway by more than 200 m.
- The elimination of an existing collector roadway.
- A change in land use in one area from a residential use to an employment use and vice versa.
- A change in location of a major traffic generator such as a hospital, public building, shopping centre, arena or other recreational centre or a hotel. This also applies to locating high traffic generation uses, such as those listed above, in areas not previously identified for this type of development, such as industrial areas or residential areas.
- A change in population or employment density in an area of more than 20 percent.
- A change in the alignment or location of a major regional traffic artery such as a provincial primary or secondary highway adjacent to the municipality.
- A change in the alignment or location of a rail line passing through the community.

Once a minor or major change has been identified, appropriate action should be undertaken. If a minor change is identified the official by-law need not be changed as long as a town administrator keeps an up-to-date copy of a plan with all of the changes duly noted on it. If a major change is identified, the plan should be reviewed to assess the impact of the change, the appropriate revisions made and amendments to the by-law can be made as required. As a guideline, the official plan should be reviewed and updated every five years.

5.3 A MAJOR TRAFFIC GENERATOR IS PROPOSED IN THE COMMUNITY

When a major traffic generator is proposed in a community, it sometimes requires a change in the transportation plan. If the generator is a conforming use in a designated area, no changes to the plan are required. However, a detailed traffic assessment of its impact on the adjacent roadway system is required along with a specific design to accommodate its access. Since each project is unique, no general design standards and guidelines can be given for these types of projects. The best way to handle these is to prepare a transportation impact assessment for the project, following the general guidelines listed below.

Major traffic generators

Since the scale of a major generator varies with community scale there is not a simple definition of this which would apply universally. Therefore, for a smaller urban centre an appropriate definition could be "A major traffic generator is any development, which is auto-oriented, and which generates sufficient traffic, that in the opinion of municipal officials it receive special consideration prior to implementation, to insure that its access complements the existing and proposed transportation system in the municipality."

In a small community a typical major traffic generator could be:

- A post office.
- A hospital, public building, major secondary school or technical college, or other large institutional project.
- A shopping centre.
- A hotel, or motel with associated banquet and meeting facilities.
- An arena or other recreational centre.
- A large fast food or drive-in type restaurant.
- A large multi-family housing project.
- Industrial parks.

Transportation Impact Assessments

As a minimum, a transportation impact assessment for a major generator should include the following:

- Details on the exact nature and size of the proposed development;
- A tentative site plan, if the development has proceeded to this stage;
- Description of incremental traffic access on the street system;

- Requirements for site access, including a preliminary layout of entrances and exits;

- Associated parking demand and the anticipated accommodation of this demand either on or off the site;

- Estimated costs of making modifications to the Town's roadway system to accommodate the proposed development.

5.4 MONITORING OF THE TRANSPORTATION PLAN

To insure that the transportation plan is updated as required and that it reacts to change, it must be monitored on a continuing basis. It is normally updated every time the General Plan is updated. In addition to monitoring the obvious changes in the plan, such as the allocation of land uses, changes in direction of growth, major generators and so on, it is necessary to monitor changes in traffic volumes. Since most smaller communities do not undertake any form of traffic engineering data collection, it is suggested that a program to collect at least a minimal amount of data be established.

Available Traffic Data

Alberta Transportation undertakes a comprehensive traffic counting program on all primary and secondary highways in the province on a continuing basis. At some locations permanent traffic recorders are situated which monitor traffic volumes on a year-round basis. These control locations are used to monitor overall traffic fluctuations in the province and to establish factors for adjusting traffic counts undertaken at various times of the year. In addition to these counts more detailed site-specific manual traffic counts and origin-destination surveys are undertaken when required. In most small communities, only selected traffic counts at adjacent primary or secondary highways are available. Therefore, it is important for the community to establish some form of additional traffic data collection.

Traffic Data Needs Of A Small Community

In general, a very modest data collection program consisting of the following will suffice:

- An automatic traffic count of a seven-day duration on the most heavily travelled street in the municipality. This should be undertaken on an annual basis.

- Selected automatic traffic counts at other locations in the municipality, beginning with arterial roadways and then doing collector roadways. These should be done on a rotational basis, such that every arterial and collector street in the municipality is counted every four or five years.

This data will provide an annual record of overall traffic growth in the community and will alert Town officials to the need for and priority for making transportation improvements.

Evaluating Traffic Data

The rate of growth of traffic and its relative magnitude when compared to the traffic volumes guidelines presented in Section 3 will indicate when certain improvements are required. Also, the relative magnitude of traffic between one roadway and another will assist in establishing priorities for improvements. However, traffic volumes are not the only indicators to be used for establishing a roadway program. Other factors include:

- The need to provide access to a newly developed area regardless of traffic volumes on the facility.
- The need to alleviate a specific traffic problem in a particular area. For example, if a local roadway is being used extensively for short-cutting traffic, the construction or upgrading of a new collector facility may alleviate this problem.
- The need to upgrade drainage or other utilities in a particular area.

5.5 CONCLUSION

The intent of this document was simply to provide some general and thought-provoking information for municipal councillors, administrators and their respective planning advisers to cope with transportation as a factor affecting growth and development in their urban communities.

This document itself attempts to bring to light a process for first identifying community transportation requirements, and secondly, preparing a strategy for integrating these requirements for future growth in the community.

It should be recognized that the guidelines, standards and recommendations outlined cannot necessarily be applied in every set of circumstances, but will at least serve as a basis for further evaluation.

Comments from readers and users in terms of the value and practicality of the information contained in this document relative to individual needs are welcome.

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